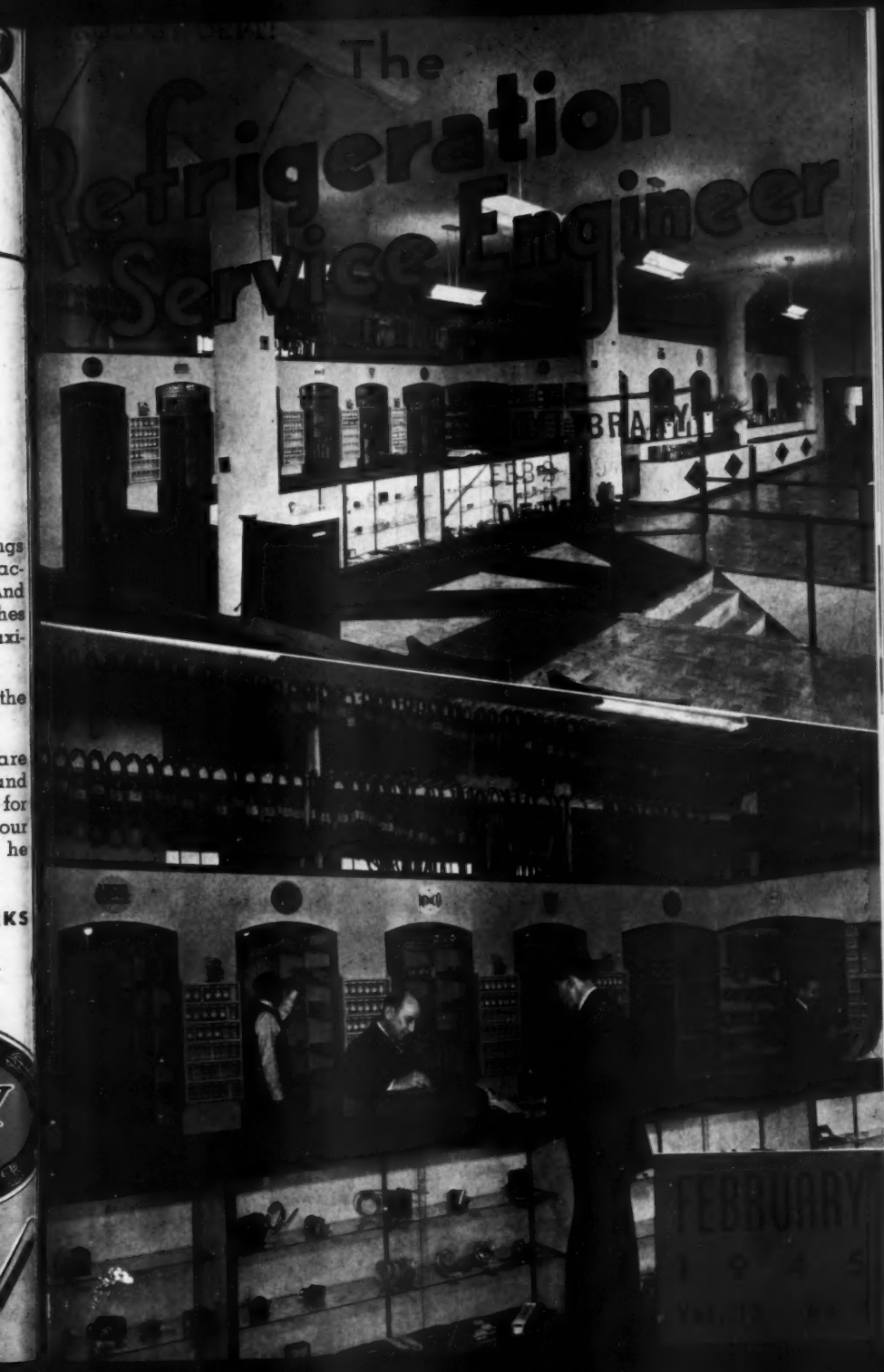
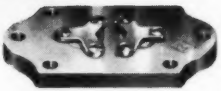

The
Refrigeration
Service Engineer
FEBRUARY

Chicago General Replacement Seal

QUIZ OF THE MONTH

Q. WHAT REPLACEMENT SEAL ALWAYS DOES THE JOB, EVEN ON BENT OR SCORED SHAFTS?

A. The CHICAGO SEAL.



Chicago Valve Plates

Refrigeration service men everywhere know that answer! They know the exclusive self-adjusting sleeve lock in Chicago Seals compensates automatically for irregularities in a worn shaft. They know, too, that Chicago Seals give triple protection against leakage. Both these advantages are big helps to the man who wants to give his customers the best possible job. And here's another well known fact, equally important: Chicago Seals help you do the job faster, at lower cost, because they are so easy to handle. No wonder, more service men are demanding and more jobbers are stocking CHICAGO SEALS every day.

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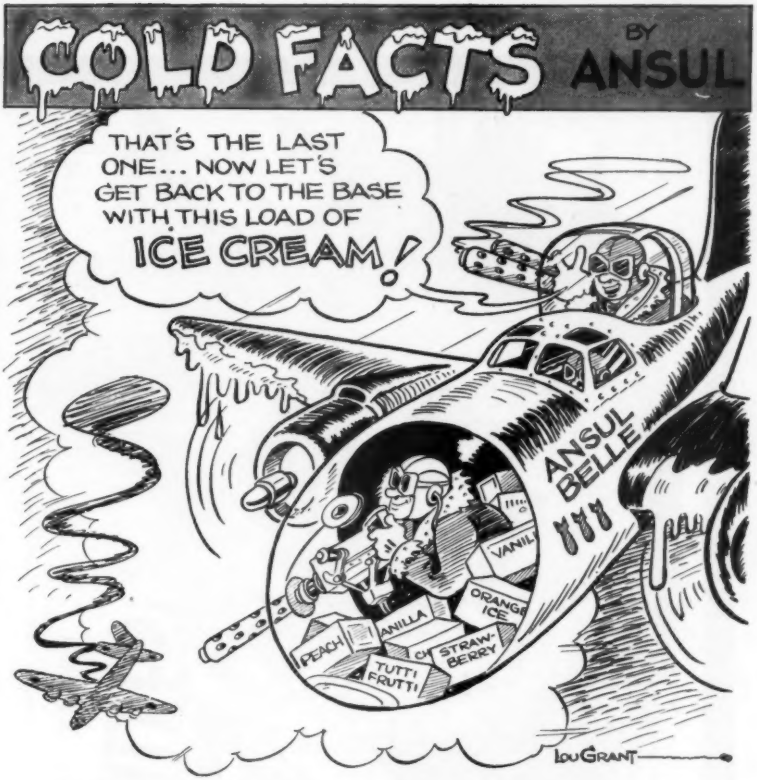
THE REFRIGERATION SERVICE ENGINEER. Nickerson & Collins Co., Publishers. 435 N. Waller Ave., Chicago 44, Ill. Published monthly. Vol. 13, No. 2, February, 1945. Entered as second class matter March 4, 1938, Chicago, Ill., under the Act of March 3, 1879. Subscription in the United States, $2.00 per year; all other countries, $3.00 per year.



IN THE STEAMING SOUTH PACIFIC, BOMBER CREWS OFTEN TAKE ALONG A GALLON OF ICE CREAM MIX WHEN THEY CALL ON THE JAPS. SUB-ZERO COLD AT HIGH ALTITUDES FREEZES THE MIX FOR AN ICE CREAM TREAT WHEN THEY RETURN.

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Like the Eskimos for instance. Since nature provides their refrigeration, they don't care a good dried fish about Detroit Expansion Valves. They, like millions of refrigeration men, however, the name "Detroit" is nearly as familiar as their own.

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Like the Eskimos for instance. Since nature provides their refrigeration, they don't care a good dried fish about Detroit Expansion Valves. They, like millions of thousands of refrigeration men, however, the name "Detroit" is nearly as familiar as their own. To these men, who *do* care about expansion valves, "Detroit" is synonymous with reliability and complete satisfaction. The widespread and enviable reputation of "Detroit" valves is attested by the if you, unlike our Eskimo friends, are interested in outstanding expansion valve performance, specify "Detroit".

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No. 897 Dura-fram Thermostatic Expansion Valve for commercial applications. Compact and easy to install.

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Only the **DFN SYSTEM** DEHYDRATES FILTERS NEUTRALIZES

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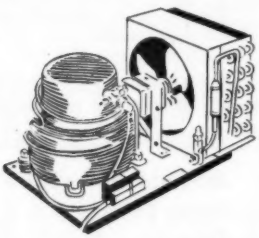
BALANCE

IS IMPORTANT IN *HERMETICS* TOO!

All of us here at *Tecumseh* are very conscious of the art of balance—we are fully aware of its supreme importance—we're building condensing units that are in perfect balance—built to tolerances in the ten-thousandth of an inch, resulting in smooth perfection of movement, comparable to the finest timepiece—without noise and without vibration.



However, the condensing unit must also be in perfect balance with the final refrigeration system, otherwise all our efforts toward perfection in the condensing unit are lost. And that's where our engineers excel.

Before settling on post-war designs consult "*Chieftain—The leader in Hermetics.*" For complete data write our sales department.

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TECUMSEH, MICHIGAN

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for Large Capacity and Long Service

7 Reasons Why You'll Like It Best!

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1. Light in weight – due to its tubular construction.
2. The strainer screen can be easily and quickly cleaned without removing the strainer from the line.
3. "Wave-Flow" design results in negligible pressure drop.
4. Cleaning seldom necessary because of large screen area.
5. Internal baffle prevents injury to the heavily reinforced monel screen. In this connection it is well to remember that suction velocities may exceed 5,000 feet per minute.
6. Patented forged steel clean-out flange is distortion-proof, making a tongue and groove anchored-gasket joint with strainer body.
7. Strainer is of welded steel construction. Rustproofed. Available with copper sockets for O.D. tubing and steel F.P.T. connections for iron pipe.

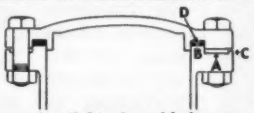
Available in ⅝" to 3⅛" O.D.S. sizes and in 1" to 3" F.P.T. sizes with screen area ranging from 23 to 175 square inches.

FOR SUCTION OR LIQUID LINES

The Henry "Y" Strainer when used in suction line service will not trap oil if the strainer is installed on its side as shown.

For liquid line service the Henry "Y" Strainer can be installed either in a horizontal or vertical position.

Why the Patented Henry Flange Is *Distortion Proof*



Strains due to uneven or excessive tightening of bolts are absorbed in the recessed area (A) and cannot be transferred to the flange gasket face (B) made up of the inner flange rim and the strainer housing to which the flange is welded. Lip on outer flange rim (C) acts as a "stop" to prevent excessive drawing up of bolts. Gasket is located in recessed area (D). Flange makes tongue and groove anchored-gasket joint with strainer.

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. . . wouldn't a refrigeration engineer look foolish holding one over a cooling unit!

However, he has known for years that TZ was specially designed to keep a refrigeration system dry. And he, and thousands of others, used more of this liquid dehydrant in 1944 than ever before. But that's an old story, for TZ has been breaking sales records each year right from the beginning.

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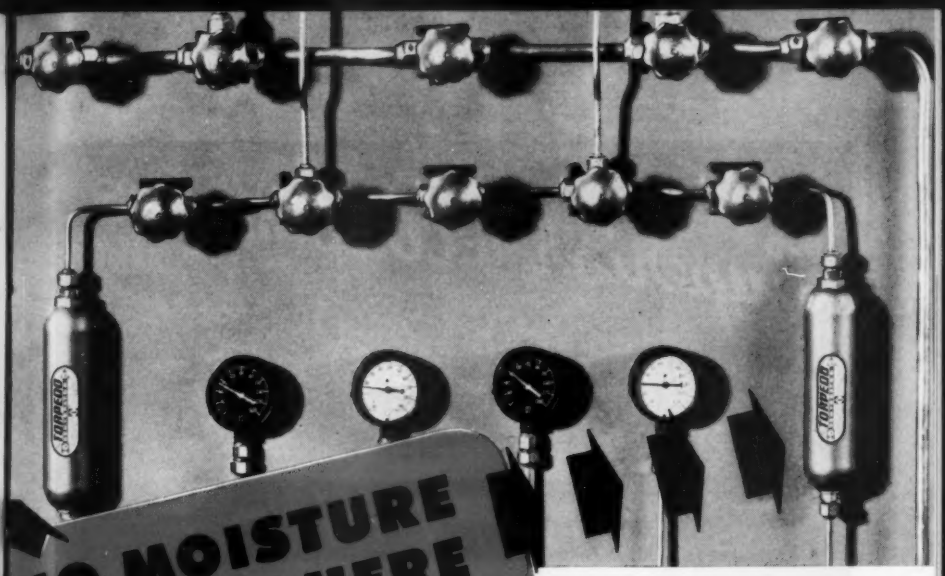

NO MOISTURE GETS BY HERE

Unique multiple installation uses Imperial Torpedo Dehydrators

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Your best weapon in the war on moisture

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- **Copper and brass construction.**
- **Packed with "Silica Gel".**

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SOLUTION: The unique multiple installation shown above, utilizing a by-pass and two compressors, was the answer. In this system, should one of the condensing units fail, both coolers can be run temporarily with the other unit.

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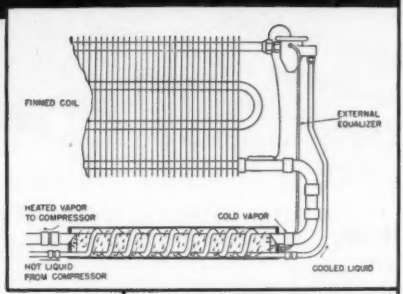

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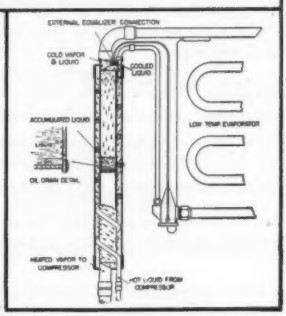

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- Maximum capacity per unit size.

"Hy-K" Economizer-Accumulators are equally suited for use in high, medium or low temperature systems.

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No 114

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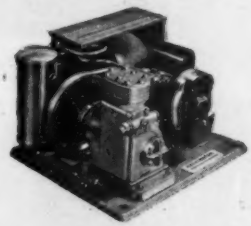

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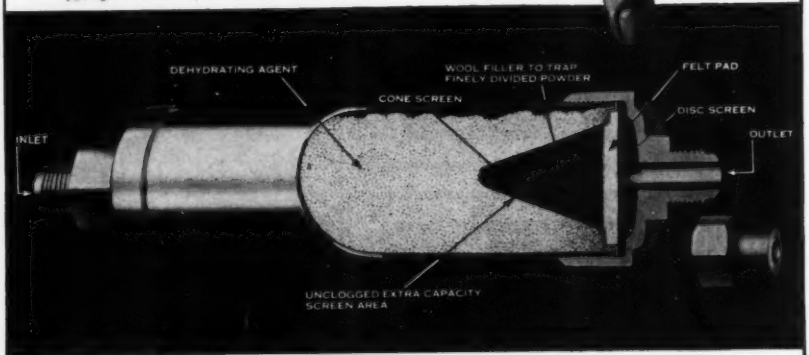
In addition, the cone screen is filled with pure wool which traps such particles that are sufficiently fine to pass through the screen mesh.

Particular attention has been paid to screen areas in Mueller Brass Co. Filters and Dehydrators, so that each size permits efficient passage to the maximum refrigerant volume that is used in a particular size refrigerant line.



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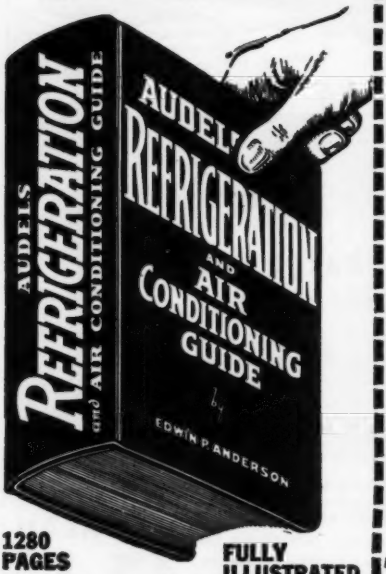

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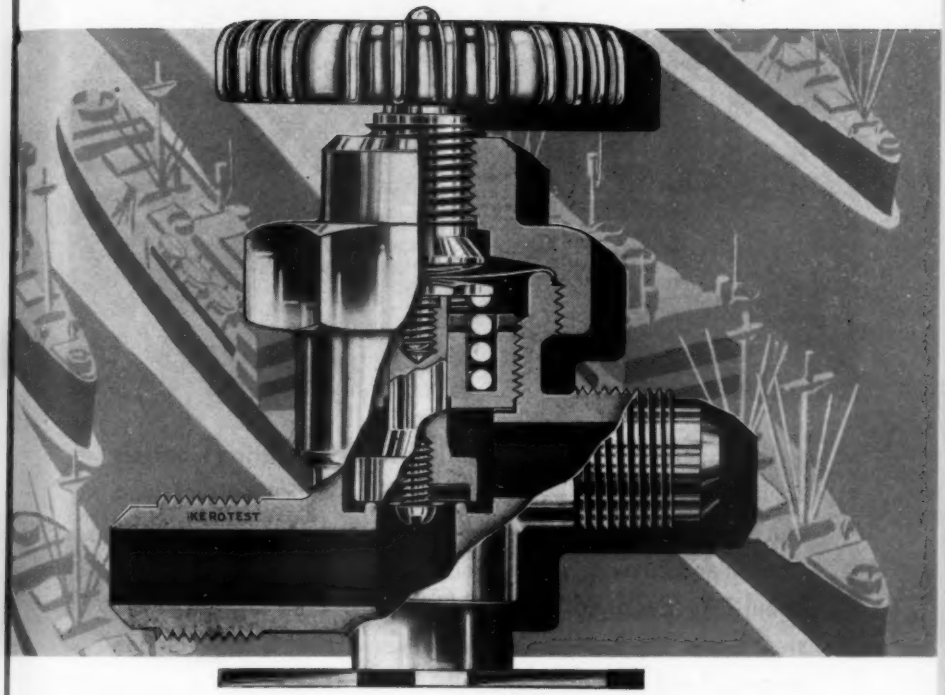

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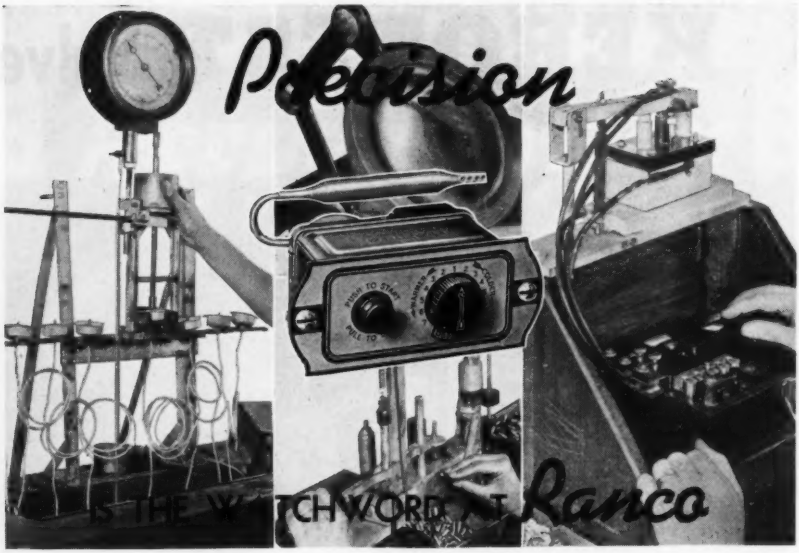

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Ranco Inc.

COLUMBUS 1, OHIO

The Refrigeration Service Engineer

Vol. 13 No. 2

February, 1945

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems

Official Organ
REFRIGERATION SERVICE ENGINEERS SOCIETY

The Cover

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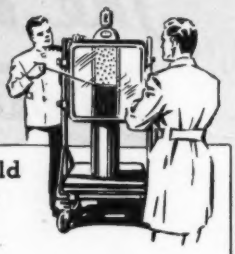
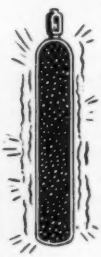
Service Engineers Should Know . . .



Why: Refrigerant cylinders should never be filled beyond their specific rated capacity.

1. Cylinders of the same water capacity have a different maximum filling capacity for each refrigerant. For instance, a cylinder with a maximum capacity of 5 lb. of SO_2 must not contain more than 3½ lb. of Methyl Chloride. X-Rayed, a properly filled cylinder looks something like this:

2. The liquid must not completely fill the container when heated to 130° F. The liquid refriggerant will expand about 11% in volume during a temperature rise from 40° to 130° F.



3. If too much refrigerant is put into the cylinder, the liquid expanding under heat may fill the cylinder completely, causing powerful and dangerous hydrostatic pressures.

4. This is this is what happens when the hydrostatic pressure can no longer be contained — the cylinder explodes violently. Never overfill cylinders; it is dangerous!

Here is a simple illustration of what happens from overfilling. A thermometer works perfectly until the mercury, expanding from heat, hits the top of the tube. And then, pouf! Play safe — don't overfill cylinders!

Manufacturers of
"Virginia" Refrigerants and Agents
for Kinetic's "Freon-12" —
"Freon-22" — "Freon-11"

VIRGINIA Smelting Co.

WEST NORFOLK, VIRGINIA

76 BEAVER ST., NEW YORK 5 :-: 131 STATE ST., BOSTON 4

Government Bureaus—*News and Rulings*

RULINGS and announcements issued by the various Government Bureaus that are of general interest to the refrigeration service industries are summarized below. Only the essential facts are given in most cases, and those who desire further or more complete information on any specific regulation or announcement are advised to write the proper Government agency.

It's Getting Tough Again

IF YOU were inclined to be somewhat complacent about the supply of parts and equipment, because the flow of material had eased up during 1944, get ready for a repetition of the early days of '42. It's getting tough again. Reliable reports indicate a stiffening in orders and regulations as manpower and materials are diverted to full war production.

Wasn't too long ago, back in 1944, the optimist was sure, "It'll be over in October" of that year, while the pessimist "couldn't see any hope before Christmas."

War materials in sufficient quantities is America's number one production job. Civilian levels of production will be maintained at the lowest minimum—and below if necessary. The armed forces have a "carte blanche" order on material and labor resources.

With manpower and raw and finished materials channelled to war production, the impact is bound to be felt in material supplies for the service industry. Again the job must be to conserve and maintain and do much more with much less.

L-38 to Be Amended

Members of the General Refrigeration and Air Conditioning Advisory Committee were informed on January 10, 1945, by the WPB that the requirements of war production will drastically reduce industry production of refrigeration equipment.

The committee was further informed of WPB's intention to limit production to levels required by policy determined by the Army, Navy, Maritime Commission, WMC, and other agencies governing production. The limitation will be a formal amendment to L-38 governing commercial and industrial refrigeration and air conditioning equipment.

Limitations of production to 4th quarter 1944 levels will probably take the form of a unit or dollar volume restrictions to prevent full usage of CMP-4B allotment to which can now be added material from inventory and material from excess or idle stocks.

The intended amendment to L-38 will eliminate the use of Form WPB541 by dealers to maintain their inventories. Form WPB547 will be continued for the present but authority under it will not be granted except in cases where supplies of particular items are available for inventories of dealers and distributors. This means that customers' ratings must accompany orders to dealers, distributors and jobbers on major equipment in order to assure a flow of such equipment for stock inventory replacements.

Under the present plan, manufacturers will be prohibited from making deliveries of condensing units and unit parts on blanket MRO ratings. The only exception to this rule will be for emergency repairs which are assigned by CMP Regulations No. 5, 5A, 9A, or P126.

New Order L-38A Pending

In the immediate future, WPB will issue a new order L-38-A controlling delivery of condensing units rated five h.p. or less. This order will require that orders from users of thirty or more units per quarter may not be accepted without approval if he is going to install them in equipment for an ultimate user. A manufacturer will be in violation of the order if he delivers more than thirty units a quarter to any one user.

S S S

Freon Production Increased

PRODUCTION of Freon 12 (Dichlorodifluoromethane) has been increased and stabilized sufficiently to permit a relaxation in restrictions on its use in refrigeration and air conditioning systems, the War Production Board announced January 30. An amendment to Order M-28 provides that Freon-12 may be used now for any refrigeration and air conditioning systems except those included in List A of the order.

List A includes amusement parks; animal hospitals; auditoriums; ballrooms, dancing studios and dance halls; bank and loan associations; bars, cocktail lounges, and beer parlors; bowling alleys; concert halls; funeral parlors; golf clubs, country clubs, athletic clubs, and all other clubs and club houses; hotels and apartment houses; moving picture houses; night clubs; office buildings and offices, public and private; railway, streetcar and bus stations and terminals; residential buildings and dwellings of all kinds; restaurants, cafeterias, and other places selling meats, food or beverages; schools; service establishments such as laundries, cleaners and dyers, tailor shops, barber shops, beauty parlors, automobile sales and service shops, and repair shops of all kinds; skating rinks; stores, selling any kind of products, material or merchandise, at retail or wholesale (excluding manufacturing establishments); studios of all kinds and theatres.

Previously, refrigerating and air conditioning systems not included in list A, such as those in food preservation establishments, industrial plants, aircraft plants, etc., could obtain Freon-12, but only under certain specified operating conditions such as where an air-cooled condenser is used and the ambient temperature is 110 degrees Fahrenheit or higher, or where the system is used in a sealed railroad car or sealed bus. The effect of this provision was to force conversion of many essential systems to other less desirable refrigerants at considerable expense and inconvenience whenever an additional charge of gas was needed. Since the supply of Freon-12 has improved considerably it is now possible to remove these drastic restrictions, WPB said.

Motor Procurement Explained

THE War Production Board, January 13 issued an explanation of controls over the sale of new fractional horsepower motors below one horsepower. This explanation was believed advisable because such motors are in short supply and because many persons apparently do not understand the restrictions regarding their sale, WPB said.

A certain number of fractional horsepower motors are being allocated each month for civilian and commercial replacement purposes. It is important to the war effort that these be sold and delivered strictly in accordance with prescribed regulations, WPB said. Order L-123 controls the distribution of these motors. It provides that no person, including a manufacturer, distributor or dealer, shall accept any order for a new fractional horsepower motor or make delivery of one except on an order bearing a preference rating of AA-5 or better. Neither can any person accept delivery of such a motor unless he has a rating of AA-5 or better.

There are, howevear, two types of sales that do not require ratings. One is the sale on a farmers' certificate of purchase provided for in Priorities Regulation No. 19. The other is delivery of a new motor to a householder or other user for replacement of a damaged motor, and the seller, in accordance with his regular business practice, takes the damaged motor in return and repairs it, or delivers it for repair to another person, so that it will be available for resale. When repair is not practicable, however, the damaged motor may be scrapped. A dealer or repairman may also turn in a damaged motor to a manufacturer or other supplier and receive in exchange a new or rebuilt motor without a rated order.

If a motor is delivered without a properly rated order or without meeting either of the qualifying provisions outlined, both the seller and the purchaser are in violation of the order and are subject to the prescribed penalties. Motor manufacturers, distributors, dealers, mail order firms, repair shops and all other sellers of new fractional horsepower motors must familiarize themselves with the provisions of Order L-123, WPB officials emphasized.

Conventions Are Restricted

ORGANIZATIONS planning to hold conventions, conferences, trade shows or group meetings after February 1 "will have to show how the war effort would suffer if the meetings were not held," Col. J. Monroe Johnson, Chairman of the War Committee on Conventions, announced January 11. This action was taken, Colonel Johnson said, to relieve overburdened transportation and hotel facilities and conserve desperately needed scarce materials and manpower.

The committee has decided that the yardstick it will use to measure the essentiality of any meeting is how the winning of the two wars we are now fighting will be impeded if the meeting in question were held to an attendance of 50 or canceled outright. The committee approved the form of application required of organizations planning group meetings to be attended by more than 50 persons.

Some of the Problems of Low Temperature Refrigeration

By S. R. Hirsch
Chief Engineer, Brunner Mfg. Co., Utica, N. Y.

BEFORE beginning any discussion of low temperature, we must define the ranges within which we will confine ourselves. For purposes of this discussion, this will be refrigerant temperatures not lower than —40° F. Within the confines of this range will come locker plants and other cold storage or process systems which come to mind and which have been installed by many of us.

We always like to consider the condensing unit as being the heart of the refrigerating system. Since it is the only moving part, it is most subject to injury and I am afraid falls heir to the faults and suffers correspondingly from the improper functioning of other system parts. Under no other operating conditions do system faults place greater stress and strain on compressor parts than under low temperature operation and it is felt that this discussion might help to show how these conditions can be controlled.

Therefore, briefly, we will discuss the following parts of a refrigeration system and the factors which affect it in low temperature operation.

Condensing Unit

Overload

A condensing unit is purchased for certain temperature limits. The low temperature unit is usually speeded up so that at 0°F to +5° F it loads its motor to full load. Any temperature above +5° F would overload the motor. Thus, during normal operation, very likely with a room at 0° F, the corresponding suction pressure or evaporator pressure would never rise above this point, but if the room temperature were permitted to rise or if during initial start the line valve were not throttled, there would be danger of burning out a motor unless overload protection were provided. Frequent kickout of the overload relay during a long pulldown often occurs because of high initial suction pressures.

A talk given at meeting of Central New York Chapter RSES.

It would be desirable if all low temperature systems were provided with limited charged expansion valve bulbs or suction pressure control valves so that the maximum suction pressures on the compressor could be controlled.

Oil-gas dilution in crankcase

It is not generally recognized how important this relationship is and how much hazard the compressor is to itself because of the rapid release of the refrigerant from the oil in the crankcase as a result of the reduction of pressure and agitation by the rotation of the crankshaft. While it is in some cases fortunate, for others it is not so fortunate that refrigerant vapors like Freon 12 and methyl chloride are solvent in refrigerant oils. Fortunate because compressor lubrication is improved but unfortunate because such mixtures are subject to violent and uncontrolled priming or frothing when there are sudden changes of pressure.

A compressor is designed to handle dry gases with some safety provisions to take care of occasional inclusions of liquid. If the amount is excessive, the liquid cannot be flushed from the cylinder rapidly enough and damage may result either in bent rods or broken head valves. In low temperature operation the danger of liquid inclusion in the cylinder is increased and therefore the matter is important enough to be discussed in detail.

It is true that a condensing unit running continuously is less likely to get into trouble than one that has to stop. What happens during the off cycle in condensing unit operation, in general, decides the life of a compressor. For while the machine is off, suction pressure will rise, the expansion valve may permit liquid to flood back to the machine, all of which drips into the compressor crankcase. Perhaps, the crankcase has a chance to cool off and permits the crankcase oil to absorb and hold a higher percentage of gas. When the machine restarts, there is a rapid pulldown and imme-

diately the gas tries to escape from the oil causing an explosive surge which is whipped by the cranks into the suction port and then on to the cylinder.

When the piston hits this slug, the damage that is possible depends only on the chance that it can readily escape and that the parts are not overstressed. However, no parts can take such blows indefinitely and eventually breakages will occur. It is seen, therefore, that occasional liquid returns to the compressor during normal running are not hazardous. It is the liquid return during the off cycle and its contamination with the crankcase oil that is a potential menace. Some discussion of the way in which the off cycle action can be controlled is in order at this point.

Size of Receiver and Refrigerant Charge

The amount of charge in a system is sometimes large such as is general with plates and other types of flooded low-sides. If the receiver is large and a surplus charge is added, there is a possibility that the evaporator can be overfilled if the expansion valve opens during the off cycle. This aggravates the degree of crankcase contamination and is especially hazardous to compressor parts. Such systems can well afford a sizeable accumulator to prevent the liquid return at this time.

Magnetic Solenoid Valve

Most important is the need for a magnetic solenoid valve ahead of the expansion valve to positively close off the liquid line so these off cycle oddities cannot transpire.

Crankcase Check Valve

Considerable assistance in preventing this crankcase disturbance from entering the suction port can be accomplished by installing a check valve inside the crankcase at the gas vent opening to the port. When conditions are normal, the valve is open and oil returns to the crankcase. When frothing occurs, the upsurge closes the valve and prevents oil from entering into the cylinder. This check valve has to be added by the manufacturer in his compressor.

Electric Crankcase Heater

An electric heater inserted in the crankcase oil to keep the oil warmer than a temperature corresponding to the pressure would prevent any gas from being absorbed during the off cycle. It is one of the most positive means of assuring uniform crankcase operation, but is a complication not usually considered nor employed except in unusual instances.

Motor Fails to Start

There are occasions in low temperature applications when the electric motor simply hums on the line but fails to start due to insufficient torque. It is a condition that happens only occasionally but unfortunately at an odd hour. The serviceman finds that by exerting much effort he can turn the flywheel over on its suction stroke and immediately the motor will start. The diagnosis is that the bearings or some other parts are fitted too tightly. Actually that is not the answer.

The flywheel turns hard because there is discharge pressure trapped in the cylinder and the force required to push against it is great. The action is usually the result of occasional low voltage which has reduced the starting torque of the motor. The sequence of actions are these. When the compressor stops, it does so purely by chance on a compression stroke. There is some oil left in the cylinder which, while the compressor is stopped, becomes warmed and boils out the entrained gas. The escaping gas builds up and closes the suction valve tight. Pressure continues to rise until full discharge pressure is exerted against the piston and starting is hard.

The remedy is to remove the head and take out all suction springs or adjust the suction valve to be sure it stays open when the compressor stops. Then no matter where the piston comes to rest, the suction valve will be open and permit this trapped gas to escape to the suction line. Then there will be only suction pressure in the cylinder and starting will be very easy.

Lowside Evaporator

Oil return to compressor

Our discussion of a lowside is confined only to its design as affecting compressor operation. One of the criticisms of a condensing unit may be that it pumps oil and that it does not bring oil back. Neither of these conditions may be the fault of the condensing unit. If the lowside leaks back during the off cycle, the compressor cannot help but pump out oil during restart and if it stays once in the lowside without return, that is because the lowside has trapped it there. If the oil does not return, there may be burnt bearings or scored piston and rings.

The problem of oil return is aggravated in low temperature installations because of the low pressure of the return gas. The gas does not have the "body" to support a large amount of entrained oil and if the return gas velocity is low, no oil will be picked up and returned. The evaporator pressure for many reasons should be operated at a point no lower than necessary. Also, the installer should be discouraged from selecting a lowside so much larger than necessary in the belief better performances are obtained. This may be true but at the expense of operating security. Unless the evaporator circuits are properly proportioned to maintain adequate gas velocity, oil trapping will result. Too large an evaporator might cause this unless the design is compensated.

Oil Becomes Trapped

Many lowside manufacturers compensate for unequal circuit refrigerant feeds by prescribing flooded operation. At the same time the condensing unit manufacturer calls for superheated gas at the compressor. The two requirements cannot be entirely satisfied without adequate provisions in the system to get both results. When a flooded type coil is operated for gas exit superheat, oil will not return. The reason is that to get any considerable amount of superheat, the coil will not be completely flooded and oil becomes trapped.

The oil particles do not enter the suction line unless the liquid level is near and in many instances, unless there is actual liquid slop-over into the suction line. Rarely can this slop-over be assured unless the thermal expansion bulb is installed far enough along the suction line to get a high liquid level in the coil. It is not always possible to get sufficient superheat to cause the expansion valve to function in a way that the liquid control will be nicely leveled in the evaporator. Assistance can be taken of the heat exchanger to give some "faked" heat to the bulb. By shifting the bulb until it is near or strapped on the heat exchanger, the heat from the condenser liquid will keep the valve open and permit feed to the desired points.

Now that the flooded coil is made to slop over in order to properly return oil, there must be an adequately sized heat exchanger to trap the overflow and vaporize all liquid before entrance into the compressor. It must not be forgotten that lack of gas due to system leaks, if unattended to for any length of time, often causes oil to lay over in the lowside.

Oil Separator

An oil separator will aid in preventing an excessive amount of oil from entering the evaporator at any one time. The separator, however, is not 100 per cent efficient and eventually oil can build up in the evaporator and will stay there unless the evaporator is properly designed and fed with refrigerant.

Heat Exchanger

The heat exchanger, as has been previously advised, is a necessary piece of equipment on this type of installation not only for increased efficiency but because properly used it can improve expansion valve performance, oil return, and free the compressor from liquid return during operation. It might tend to aggravate liquid return during the off cycle because the heat will cause the expansion bulb to remain open and, for this reason, a liquid solenoid stop valve is essential. The thermal expansion valve bulb should never be placed on the compressor side of the heat exchanger because then raw liquid could be introduced to the machine.

Defrosting

The subject of defrosting is a topic that needs more complete discussion than space permits. If improperly done, it will bring about more damaged machinery than is realized. Water defrosting is perhaps less potentially dangerous than hot gas. It is practically impossible to stop the compressor, apply heat to the evaporator, then restart without having a compressor full of liquid. The evaporator before defrosting should be partially or completely pumped down and then segregated from the system by closing off the liquid line and, in some instances, the suction line. Heat can then be applied. Upon restart, keep the liquid line closed, start the compressor and gradually open the suction line until pressures at the compressor are normal. If the suction line is left open when the liquid line is closed, the compressors should be kept running during defrost to keep the evaporator pressures down.

For hot gas defrost, the evaporator becomes a condenser and all liquid feed from the receiver must be closed off so no additional refrigerant can enter the coil. The hot gas delivered from the compressor will condense in the cold evaporator and cannot be returned to the compressor without being re-evaporated either by heat from some auxiliary source like a hot blast heater or fed to some other evaporator in the plant. A

special treatment must be given these circuits so as to keep liquid out of the compressor.

Refrigerant Control Valves

Expansion Valve

Expansion valves are really a problem in low temperature operation. Because of the low temperature and corresponding low pressure, there is not much actuating force to control the valve and it is therefore subject to insecure or perhaps irregular performance. Generally, there isn't much superheat to contend with and the control reacts badly. The valve manufacturers recognize deficiencies and have designs that try to compensate for irregularities.

High or Low Pressure Float Valves

To overcome some of the vagaries of expansion valves, it is sometimes desirable to more positively control liquid levels in evaporators with float controls. Lowside manufacturers have not always given the consideration they should to the use in larger systems of this form of refrigerant feed. A solenoid liquid stop valve is also imperative with these controls.

Automatic Control

The manner in which the compressor and system is controlled by its automatic switches has a great deal to do with the satisfactory performance of the condensing unit. It is not entirely satisfactory to control low temperatures with a pressure control although many small systems such as ice cream cabinets, etc., are so arranged. The most desirable way to control a condensing unit is with a pressure control in combination with a temperature control. The thermostat controls a liquid refrigerant solenoid valve and the compressor motor is started and stopped with the pressure control. Every time the compressor stops, it partially pumps down the evaporator which is desirable particularly prior to defrosting as explained previously.

Moisture

I believe the serviceman has become very learned about troubles due to moisture. They are always present and can be especially troublesome because of the possibility of drawing in air through any part of the lowside when pressures are below atmosphere. Our recommendation has always been to dry out the system beforehand and use line dryers where possible. We realize, however, that some of the commercial liquid dehydrants such as Ice-X or Thawzone have proven very satisfactory for those systems which do not seem to respond to methods other than heat and evacuation. It must be understood that the manufacturers must assure you that no injury will be done the equipment if such anti-freeze agents are employed.

Freon 12 and Freon 22

I do not see any reason for conflict in the use of these two gases. Freon 12 is quite effective down to the ranges covered by this discussion. Freon 22 can also be used but there is no benefit in performance while the higher pressures involved prevent the use of the standard condensing unit unless water temperatures are low so head pressure can be kept below 200 lbs. Usually in adapting Freon 12 equiment to use of Freon 22, the valves may need strengthening or pressure controls or water valves will have to be changed to permit operation at higher pressures. In practice, more water seems to be used with Freon 22 than 12 because of trying to keep head pressures within that of the Freon 12 ranges. If the compressor and condenser were designed for higher head pressures, say 250 lbs., then water rates would be in line and the system could balance at higher pressures without danger to the compressor parts. For very low temperatures below —40° it is unquestionably more desirable to use Freon 22.

Conclusion

I hope that this discussion will be the means of the reader solving and correcting some of the system complaints that face him in low temperature operation. They are recommendations that have been successfully applied and have worked. There is no fear this type of installation when a knowledge of its workings are available. This article should in some measure, at least, post him on the major needs.

H. N. Stine
Berrysburg, Pa.

I can hardly get along without THE REFRIGERATION SERVICE ENGINEER. I consider it one of the greatest necessities for my business as I have received some very valuable information from it and do not want to be without a single issue.

Manpower—Critical Commodity

A LIST of critical and essential activities to be used as a guide by Selective Service Boards was issued January 16 by the War Manpower Commission. Men in the 26 through 29 age group will be considered for military service in accordance with this directive issued by James F. Byrnes, director of War Mobilization and Reconversion. It was pointed out that all the activities prepared under 35 separate groups are *essential* but only certain ones of these in each group were considered *critical*. All technical, scientific and research personnel were placed on the critical list regardless of the group in which their activities are classified. Group 31 covering repair services lists the following occupations as critical: in-plant maintenance; repair of industrial and mining machinery and equipment; repair of automobiles, busses, trucks, tractors, and farm equipment; tire repair.

Refrigeration Service Classed as Essential

The *essential* activities in group 31 apply only to those individuals who are qualified to render all around repair services on one or more classifications of the following equipment:

Refrigerators; electric appliances and motors; engines; heating equipment; welding service; installation of insulating material; armature rewinding. This is only a partial list of the repair classification giving activities of interest to service men.

Hershey Outlines Classification Procedure

General Lewis B. Hershey, Director of Selective Service, in a January 19 letter to local boards states: "A substantial part of our calls from this time on will have to be filled with men in the age group 26 through 29. Those who are selected for service in the armed forces must be taken as nearly as possible in the order of their essentiality, the least essential being taken first."

In transmitting the essential activity list, the Director of War Mobilization and Reconversion has recommended that the list be used as a guide in determining the men to be selected for the armed forces in the age group 26 through 29, and that they be taken to the fullest extent possible in the following order:

(1) registrants not employed in an activity appearing on the essential activities list.

(2) registrants whom the local board finds to be employed in relatively unimportant jobs in essential but not critical activities.

(3) registrants whom the local board finds to be employed in relatively unimportant jobs in critical activities.

(4) registrants whom the local board finds to be engaged in relatively more important jobs in essential activities.

(5) registrants whom the local board finds to be engaged in more important jobs in critical activities.

Refrigeration service men qualifying under group 31 of the WMC list and subject to call will find their classification covered in the fourth grouping of the "essential activity list."

Reports indicate that few deferments can be expected in the age group up to 29 years, except where it can be conclusively shown their separation from employment would jeopardize vital war production or the public health.

Service men in the group over 29 may fare better in securing deferment if they can prove their all-around qualifications and the essentialness of their services in maintaining existing refrigeration equipment.

Reclassification in 1-A will require an appeal for further deferment under the present WMC list of critical or essential list of occupations.

More Service Required This Year

It can be anticipated that this season's service season will be more critical than past years. Equipment has another year of added depreciation and further diversion of manpower to war production or the armed forces will throw additional burdens on remaining service men.

Passage of the "work or fight" bill is designed to direct manpower to critical industries. Men in the 18 to 45 group will be affected.

(Continued on page 50)

The Coldspot

Here is the third article of a series giving detailed servicing instructions on Coldspot Electric Units, compiled by permission from the Service Manual issued by Sears Roebuck & Company, makers of the Coldspot Units. This is the first authorized publication of this material and will prove of inestimable value to the thousands of service engineers who daily come in contact with these refrigerators.

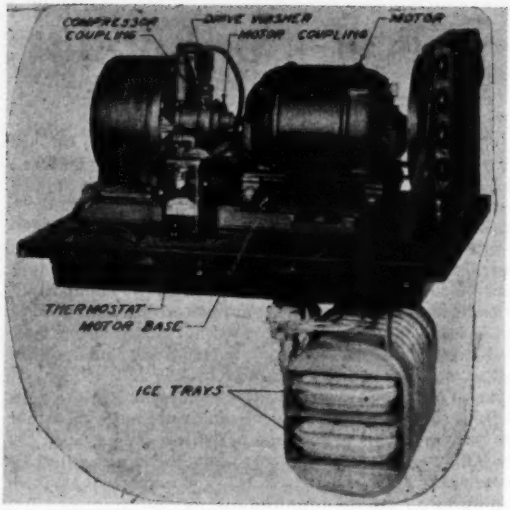


Fig. 17.

(Continued from January issue)

Leaking Check Valve

If the check valve leaks, hot gas and-or liquid is permitted to enter the evaporator at the end opposite the expansion valve. Because the flow is not controlled by an automatic valve defrosting is likely, and since the thermostat bulb is clipped to this end of the evaporator tube, it will warm up rapidly and start the motor. Therefore, two symptoms of leaking check valves are: (1) Defrosting of "tail" of evaporator; (2) Short "off" cycle.

Because the evaporator is warmed up unevenly by the hot gas entering through the check valve the front portion of the evaporator is maintained at an *average* temperature lower than normal and box temperature may, therefore, be lower than normal. The only possible correction for check valve leak is to flush it by dumping the receiver as described in Service Operations, to be discussed later.

Care of Seal

Seals should be oiled with light mineral oil before running the unit (see Fig. 12). After several months of operation, the dust and dirt around the seat should be washed off with oil. No attempt should be made to pull the seal button off of its seat at any time because as the seal button turns, rings of microscopic size are formed in the button and seat to produce a gas-tight joint. Moving the button tends to dis-engage these rings and may cause leaks.

In case of gas or oil leaks at the seal, it is sometimes possible to correct by "running-in" under pressure. Open the expansion valve to maintain a constant evaporator temperature of about 20 degrees, corresponding to a gauge pressure slightly above atmospheric, about 3 lbs. Cover the condenser, motor, and compressor so that the unit will heat up, raising the head pressure, which should be as high as possible without causing the overload to trip. The high pressure thus built up inside the seal assembly forces the seal button tightly against the bronze seat. Continuous running under these conditions for about 2 hours may wear-in, or reseat the seal surfaces and stop the leak.

Oil should be dropped on the joint between the seal button and bronze seat several times during the first two hours. Use white mineral oil or that furnished with the unit. After running the unit for about two hours, stop it and check for leaks. If the leak has not stopped, run the unit a longer period and check again. Then remove the covering, adjust the expansion valve properly and

allow the unit to cycle in a cabinet or enclosure. Check for leaks after several hours of normal operation. If it becomes evident that the leak cannot be corrected by the above method, return the unit to the factory.

The process of running-in is speeded up and made more positive by starting and stopping the unit 15 or 20 times during the first 10 minutes of run-in.

Seal Leaks

Seals may leak either gas or oil. Usually an oil leak is followed by a gas leak. For this reason, units should be checked for oil leaks by visual inspection of the compressor front head.

It is easy to confuse a discharge line leak at the fitting for a seal leak as the white smoke will spread to make the point of origin difficult to see. Careful observation while holding the ammonia swab close to *but not touching* the suspected points will disclose the greatest concentration of vapor at the actual leak.

Ammonia is corrosive to copper and copper bearing metals. Use a swab held *NEAR* the parts being tested, but do not touch the swab on the parts, especially do not touch the seal parts with an ammonia swab. Wipe off any drops of ammonia and apply oil to prevent corrosion.

Your attention is again called to the importance of a thorough understanding of the Coldspot lubrication system because the most effective service on seals requires complete knowledge of the method of supplying the seal with oil.

When a seal leaks, it is either the result of a lack of lubrication or because some foreign particle gets under the seal and starts a grinding action which destroys the polished seal surface. In either case, the only cure which can be effected in the field is by supplying plenty of oil and polishing the seal surfaces by running-in *under pressure.*

It has been shown in this section under "Lubrication" that the pressure in the seal bellows is reduced when the unit is running, and is the same as "High Side" pressure when the unit stops.

It was also pointed out that additional oil is delivered to the seal each time the unit stops. Therefore, since it is necessary to supply oil and pressure to the seal in order to stop a seal leak, it is only necessary to follow procedure under "Care Of Seal".

MOTORS

A number of different types of electric motors have been used on the Coldspot unit and each one will be covered here from the standpoint of application, wiring method and service procedure.

Repulsion-Induction Motors

Repulsion-Induction (R.I.) motors manufactured by Century Electric Company were used on most units made in 1930-31-32 (Models A-B-C-D-E-F-G). They were spring mounted motors attached to a steel bed plate which either was welded to the U-shaped receiver or was part of a cast-iron chassis, Fig. 17.

The R. I. motor on Coldspot units can be recognized by the type of mounting and by the fact that a commutator and brushes are found at the fan end of the motor.

The R. I. motor utilizes two windings, starting and running. The starting effort of the motor is supplied by the repulsion type motor winding which uses the commutator and brushes. The running or main winding is an induction type which maintains the motor at running speed by sychronous induction.

The brushes are carried in an assembly which causes the brushes to be withdrawn from the commutator when centrifugal weights actuate the mechanism. When the motor is idle, the weights which are found in the coupling end of the motor, are drawn toward the shaft by springs and the brushes are in contact with the radial commutator at the fan end of the motor. When the thermostat closes, the current through the repulsion windings (commutator and brushes), and main winding supply the necessary torque to start the motor under load. The centrifugal weights are designed to fly outward when turning about 1,200 R.P.M.

The outward movement of the weight pushes, by means of a lever linkage, a number of rods parallel to the motor shaft in the rotor and these rods in turn move a ring at the fan end of the motor and cause

the brush tension springs to release. The brushes are thrown back by the commutator when the brush springs are withdrawn by the centrifugally actuated mechanism.

A commutator shorting ring is moved into place around the commutator segments by the centrifugal mechanism when the motor gets to speed. The rotor windings must be shorted at the segments to permit the continued operation of the motor as an induction type.

The shorting ring must make firm, clean contact with *each segment* of the commutator. If the ring does not close every circuit in the rotor, the motor will run with a throbbing hum due to the uneven power delivery. The ring and the segments must be clean and even so that uniform contact will be possible at every point. The motor continues to operate as an induction motor after the centrifugal mechanism throws out the brushes.

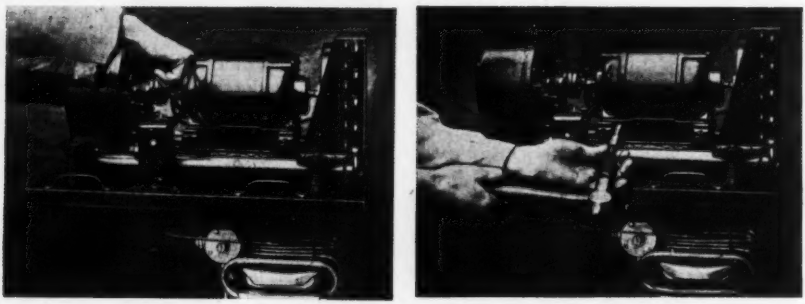


Fig. 18—Left, raising Century Motor; Right, lowering Century Motor.

Aligning the Motor

To check the alignment of a spring mounted motor remove the coupling or drive washer by loosening the set screw in the motor drive coupling and sliding the coupling back on the shaft. Slide the coupling back along the motor shaft until the pins of one coupling make contact with the pins on the other coupling for about ¼" of their length. Tighten the set screw and run the unit.

By pressing upward, downward, and back and forth sidewise on the coupling end of the motor by hand while it is running, it will be found that the coupling noise will increase or decrease. *If an increase in noise accompanies the movement in all directions, the motor is in correct alignment.* If the movement in one direction is found to decrease the noise, the motor should be realigned as follows:

Determine which way the motor should be moved to secure alignment, whether up, down, sidewise, or a combination of two directions.

The method of raising or lowering a motor is shown in Fig. 18. Century Motors have a flexible base which can be bent to correct the vertical alignment. *To raise the motor* insert a screwdriver between the body of the motor and the support and pry the motor upwards. *To lower the motor,* place a screwdriver or punch against the motor support and hit sharply with a hammer. Both of these operations may be made at as many corners as found to be necessary.

To secure sidewise alignment, the motor mounting base can be tapped with a hammer and punch either forward or backward on the mounting plate.

Sunlight Clutch Motors

The Sunlight Clutch Motor is a split-phase type with a starting clutch built in. The clutch is a centrifugally actuated cone clutch mechanism which allows the rotor to turn in starting, before the shaft is finally engaged. The rotor in this way can revolve alone under no load until the clutch locks it to the shaft. Therefore, the load is applied after the starting switch has opened and the running winding only is supplying the power.

Alignment of Sunlight Clutch Motor

Alignment of this motor is accomplished by means of adjusting screws and wedges. The coupling washer is first removed and the pins of the couplings brought into contact of about ¼" of their length. The unit is started and the noise caused by the pin to pin coupling contact is noted.

To change the position of the motor, loosen locknuts "A" (see Fig. 19) and set screw "B", "C", and "D" on both ends of the motor. If the motor is to be raised, screw in on set screw "C", which forces wedge "F" under the motor suspension. Do the same on the other end of the motor; but on the opposite set screw because the wedge moves in the opposite direction. To lower the motor, screw in on set screw "D" which releases the wedge from under the motor suspension. Do the same on the other end of the motor. After the motor is in proper position, take up the slack on the other set screws. Then bring locknuts "A" down tight to lock adjustment in position. The set screws and locknuts must be drawn tight or the motor will not stay in position.

To move any motor sidewise, loosen slightly the four bolts holding the motor base and, with a hammer and screwdriver or punch, tap the base into the desired position.

A motor is properly aligned when, with the pins of the couplings engaged metal to metal, it runs perfectly quiet. When alignment is secured, slide the motor drive coupling back and insert the drive washer.

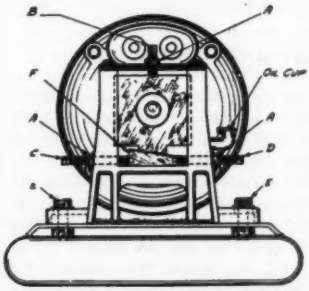


Fig. 19—(Above) Aligning Sunlight Motor.

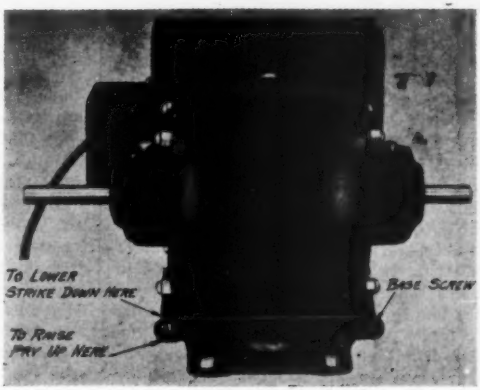


Fig. 20—(Right) Aligning G.E. Motor.

Capacitor Motors

Capacitor motors use a special electrolytic condenser (capacitor) in series with the starting winding and switch to change the phase of the starting winding current for high starting torque but minimum starting current.

The earliest models of General Electric Capacitor motors on Coldspot units included a transformer and capacitor in a large metal container, either attached to the motor frame or to the unit lid. These motors were also spring mounted and required alignment with the compressor.

Alignment

The General Electric Capacitor motor is aligned in a manner similar to that of the Century except the force is applied at different points (see Fig. 20). In aligning this motor put the pressure on the bent-up portion of the base plate so as not to loosen the base screws. Use a punch or bar and

(Continued on page 70)

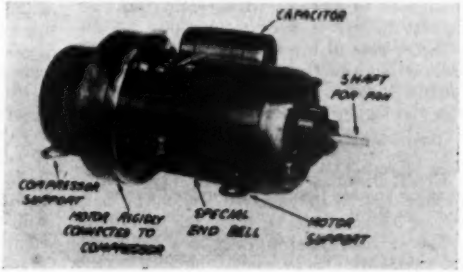
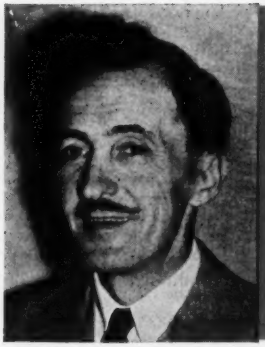


Fig. 21—Motor rigidly connected to compressor.



So You Want to Get Into Business for Yourself!

By Paul B. Reed

Chairman, Wartime Educational Committee, R.S.E.S.

Mgr. Refrigeration Div., Parker Corp'n.

ARTICLE IV—THE IMPORTANCE OF CREDIT AND FINANCING

OUR system of business in these United States, known as the "free enterprise" or "capitalistic" system is by far the most successful system the world has ever known. It has resulted in a scale of living for Americans that is so far above all the rest of the world that a comparison isn't even close. It has made us the envy of all the world. It is based on two simple facts: 1. If you use a man's time and effort (labor) you have to pay him for it. 2. If you use a man's money (capital) you have to pay for its use. Money at work is entitled to a fair wage, for it represents someone's labor that has been saved up and lent out to others.

A banker is a man who borrows money from many people (depositors, etc.) and pays them interest on it and who in turn lends it to other people at a little higher rate of interest, the difference being his profit. If he lends a large amount to a person or a group of persons who can easily pay it back (large companies, cities, states, etc.) he can afford to take a low rate of interest, for it is a safe "wholesale" transaction. The small loan to a person whose ability or willingness to pay it back is less sure, means a higher rate of interest, for it is a "retail" transaction and the percentage of losses on unpaid loans is greater. The greater the risk the higher the rate of interest.

Credit Rating

Credit involves two factors (1) Ability to pay (2) Willingness to pay. The borrower obviously must have the money to repay or assets that will act as a guarantee of payment. These consist of real estate, stocks, bonds, personal property, etc. that, when put up as guarantees for repayment of a loan are known as "collateral." They must be of enough value, even at a forced sale, to equal the amount of the loan.

A banker doesn't want the "collateral," he wants the money. It costs him money to foreclose a loan and take and sell the collateral in order to get his money, so he wants to lend to people who keep their promises, who will repay the loan when they promise to, rather than to force the banker to foreclose to get his money. This is where a good reputation for honesty and promptness in meeting obligations is valuable. A business man who is known to be dishonest or who is slow in paying his bills or loans, will have trouble getting credit or making a loan even though he has enough property as collateral. *Guard your credit reputation carefully; it is your greatest asset.*

A Business of Your Own

To start in working for yourself, independent service, requires very little money initially. You can work from your home, using a corner of the basement or garage for your tools and material. You must have a car of some sort; a panel truck is fine but you can use a passenger car. Your wife can take the calls and help you with your records and other paper work.

For that kind of start about all you need is enough to tide you over until you can build up your business to the point where it will support you. How long this will take will depend upon your location and your competition but most of all, upon how aggressive you are in getting the business. We might even say that it depends mostly on

how good a job you do of selling yourself and your service to the users.

Do not make the mistake of starting out too cheap. If you really know your business, you can get a fair price for your service; if you haven't had enough experience—say at least 4 or 5 years—you would be better off working in a larger service organization until you gain enough knowledge and experience to enable you to strike out on your own.

Some servicemen have started working for themselves with a car, some tools and less than $100 cash in their pockets but that is hazardous. They probably lived mostly on soup for the first couple of months. You should have a few hundred dollars; at least enough to carry you for two or three months.

An independent service operator usually buys most of his material, parts, refrigerants, oils, tubing, fittings, etc., from one or more local refrigeration supply jobbers. If you have a good reputation, he will give you limited, short time credit, which he will later allow you to increase if you pay your bills promptly and if you seem to be doing good work and increasing your business.

Building a Reserve and Credit

Just as soon as you possibly can, start building up a cash reserve. Build up your bank account. This will accomplish three main purposes. (1) Acts as a "sinking fund," to enable you to weather an emergency or a period of poor business or slow pay or if you have a customer "beat" you out of a bill. (2) An expansion fund that you can have on hand in case an opportunity arises to put over a good deal or in case you run across a good bargain for cash money. (3) To show your banker that you are a man of some substance; you may need to float a loan sometime. He will be more likely to lend you the money if you have demonstrated that you are a good businessman.

Your Banker as a Partner

As soon as you start in business for yourself, choose a good bank that seems progressive, perhaps one in your neighborhood, and open a checking account. Watch it carefully, *never overdraw*, build it up. Go to your banker when in doubt about money matters. Ask his advice. Money matters are his business. He knows them like you know refrigeration service. His advice is likely to be good. Do not go against his advice without *very* careful deliberation and if possible, advice from some other competent source. Your banker can and is very likely to be a good friend. Cultivate him and let him help you.

Another friend is your refrigeration supply jobber. If you need advice, go to him. He will help you if he can, and he usually can. If you get an order for a replacement coil, a condensing unit or even a refrigerator or freezer, and you do not have a connection with a manufacturer, see your jobber. He may be able to supply it from his stock or if not, he can probably suggest where you can get it. Cultivate your refrigeration supply jobber. You can help him and he can help you.

The Fallacy of Over-Expansion

There is a saying "You have to crawl before you can walk." Don't be ashamed to start out on a small scale. Get yourself firmly planted before you start to grow and branch out. One common and often disastrous mistake many businessmen have made is to over-expand. When business is booming they built up big organizations suitable for a big volume of business. The overhead was big but not out of proportion to the volume of business. Then a period of low business volume came along. They misjudged how long it would last, held their big organizations together, used up their cash reserves (probably not as big as they should have been) to pay the big overhead, borrowed money, still hung on in the hopes that big volume would return soon and that they would then have their big organization intact to meet it. But they were top-heavy and when they did realize that they were going to have to reduce their size, it was too late and they were hopelessly in debt and finally had to go into receivership. Some companies who have had phenomenal growth during the war are right now tremendously over-expanded; they will be fortunate if they can contract fast enough when the war ends and their big war contracts suddenly stop.

Service Shop to Dealer Transition

If you do reach the stage where you want to expand, open a store, and become a dealer in addition to your service business, buy stock and floor samples of refrigerators, condensing units, blower coils, freezers, etc., put on another serviceman or two, rent a build-

ing for a shop, buy some expensive equipment, or otherwise enlarge your activities, you will have to put some more money into the business. You may have saved enough but you may need more than you have and still enable you to keep a minimum cash reserve. Then is when your reputation with your banker will come in handy.

If you are now in military service you will be eligible under the "GI Bill of Rights" for help by Uncle Sam. This bill provides that the U. S. government will guarantee payment (go on your note) of one-half of a loan that you may make at a bank or other private financial institution, providing that the one-half doesn't amount to more than $2,000 and further provided that the money is to be used to buy a farm, buy or build a home or to buy or build up a business. The $2,000 is not a gift—you have to pay it back nor do you borrow from the U. S. government.

Moreover, you are going to have to show the banker that it is a good proposition that you are going into. Remember, the U. S. government only guarantees one-half. So if you borrow $2,000 from the bank, the U. S. government guarantees only $1,000 instead of the maximum $2,000. You are going to have to have something that will induce the banker to take a chance on the other $1,000 for which he has no guarantee of repayment from the U. S. government. He may require that you put up bonds, stock or other collateral for $1,000. He might be satisfied with someone with property or other assets going on your note for the $1,000. Or he might be willing to take a mortgage on the equipment that you buy, store fixtures, stock of appliances, tools, automobiles, etc. How long he will give you to repay depends on your mutual understanding.

Suppose, for example, the loan becomes due in six months. It would be fine if you could pay the full amount, $2,000, when the loan became due. If you cannot pay it all, pay as much as possible. If you can pay one-half, your banker will probably renew the loan for the unpaid $1,000. You will have shown your good faith and demonstrated that you are making money.

Your Capital Investment

The amount of money invested in your business is your "capital." If you are just "working for yourself" in the service business, from your home you can get by very well on a capital of $500 to $1,000. If you use a truck with panel body that can be locked up and which has cabinets, bins and shelves for parts, tubing, wiring materials, refrigerants, tools, etc., an additional $1,000 at least will be needed. If you have a well-equipped shop, perhaps with a small lathe, drill-press, test bench, bake oven, etc., you can easily invest in it another $1,000 to $2,000. So even if you are "working for yourself" you can very easily have as much as four or five thousand dollars in the business.

Then don't forget the "accounts receivable," the money that you have out in material, and other expenses for jobs for which the customers haven't paid you as yet. If you have one or more men working for you these investments increase. All of these investments will vary according to circumstances. If you service nothing but domestic refrigerators, you will need less tools and less stock than if you service both domestic refrigerators and commercial installations. If there is a good jobber in the same city, you need not have as great an investment in stock as if you are in a small town with no jobbers and have to carry a stock of your own. However, you will find that certain items must be purchased in quantity to get the best discounts.

Working Capital Required

It is when you become a dealer that the real need for money begins. A dealer has money tied up in store fixtures, office furniture, signs, samples, and a stock of refrigerators and other merchandise. But more important than these is the money that he must tie up in "accounts receivable" consisting of "charge" accounts and time-payment sales. Normally, charge accounts are supposed to be paid within 30 days, but some people take 60 or 90 days, so that you have more money tied up than you normally should have. Time payment sales are carried by the finance company, but it sometimes takes a little time to get the customer's credit rating established and the finance company may require a "hold-back." Slowness on the part of a building contractor or others, shipping delays or trouble with the equipment may delay completion of a new installation and hold up payment of your share of the job. All these things increase your investment in "working capital," will call for your carrying a bigger working reserve, and must be taken into consideration of your costs.

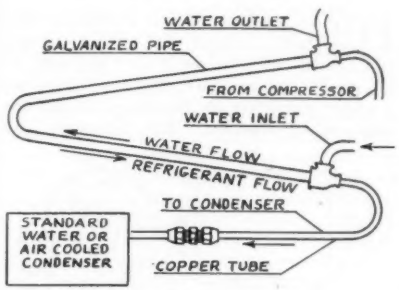
SERVICE POINTERS

Practical Solutions of Your Service Problems

EDITOR'S NOTE: Here are additional contributions submitted in the Service Pointers Contest. Others will appear in the next and following issues.

CONDENSER PRESSURE REDUCED

DURING the summer months when the water or air temperature for condenser cooling is high, the capacity of the unit can be maintained by arranging the pre-cooler shown here. This additional condensing surface is constructed of ½ in. tubing put through a 22 ft. length of ¾ in. galvanized pipe. The water inlet and outlet is on the branch of two ¾ in. tees and the tubing is soldered to the ⅜ in. outlets of the tees.



Disconnect the compressor and connect the outlet of the pre-cooler to the condenser. Connect the pre-cooler inlet to the compressor discharge. The pre-cooler need not be formed into a coil if sufficient wall space is available for mounting as shown.—*Submitted by M. Van Lierde, Milford, Pa.*

CHECKING THE CHARGE IN THE GRUNOW—ADDING CARRENE

INDICATIONS OF A NEARLY CORRECT CHARGE: Suction line is warm at compressor and cool as it leaves the cabinet. Normal frost on evaporator and a popping noise in the evaporator caused by gas bubbles hitting the top of the evaporator.

SPECIAL TOOLS: Use service kit valve if the evaporator has a service port. Otherwise use a charging "T" made from a ¼ inch T with a valve on the side leg and a short piece of ¼ inch tubing and flare nut on one of the through legs.

PROCEDURE: Insert the charging T in the liquid line at the back of the cabinet. Purge the meter and let the unit run long enough to boil all the carrene from the oil in the compressor and cool the carrene in the evaporator.

Submerge the end of a service line connected to the valve of the charging T in carrene and open the valve slightly. Carrene will be drawn into the system. Place one hand on the compressor suction line and close the charging valve at the first sign of cold liquid in the suction line.

Let the unit run about 15 minutes and add more carrene, if necessary, to overflow the evaporator slightly as shown by a cool suction line. The unit is now overcharged unless there is considerable oil in the evaporator.

With the motor off, disconnect the charging T and reconnect the carrene meter line to the cabinet line. Do it quickly or carrene will siphon back down the liquid line. Open the meter purge valve and block the fan or condenser. Start the unit and purge air and gas until the suction line at the compressor, and the carrene meter are warm.—*Submitted by C. L. Carter, Pueblo, Colo.*

MOVING REFRIGERATOR WITHOUT DAMAGING FLOOR

WHEN it is necessary for one to move a refrigerator when servicing the unit, the entire box can be easily moved across flooring or linoleum without marring by first following these directions. Prepare a pail of soapy water then mop the floor around the legs and area in the direction of the move. The heaviest domestic refrigerator can be moved by one man if this procedure is followed. When adjustments on the machine are complete, repeat the moping process before setting the box back in its original position.—*Submitted by I. Arnold, Yonkers, N. Y.*

LOW-TEMPERATURE HOOK-UP FOR STANDARD T.E.V.

THE firm for which I worked contracted to build a number of sub-zero cabinets to maintain —30° F. The evaporators were made of one hundred and fifty feet of 1¼-in. steel pipe. The condensing units were 2 h.p. combination air and water cooled using Freon-12. Experimental tests could never get the temperature colder than —15° at which point the expansion valve (different makes and types) would cease to function.

We then installed six feet of ⅛-in. capillary tubing in parallel with the thermostatic expansion valve. The results were unbelievable, because the cabinet dropped to the desired temperature in thirty minutes. All the units were then hooked up in this manner. Cabinets have been in operation for about two years, with no development of trouble. The charge is critical as on any capillary tube system and the expansion valve must be installed because the cabinet would not otherwise have a rapid pull-down.—*Submitted by Floyd Johnson, Hemet, California.*

CLEANING COPPER AND BRASS

A VERY effective solution for cleaning and deoxidizing short circuiting necklaces, sweat fittings, lugs, or any copper or brass parts, can be prepared by mixing the following liquids. They must be added in the order given to prevent too violent a reaction during the mixing process. The specific gravity and volume must also be carefully observed.

Liquid	Sp. Gravity	Volume
Water	1.0	491 CC
Sulphuric acid.....	1.84	435 CC
Nitric acid	1.38	72 CC
Hydrochloric acid.....	1.17	2 CC

The acids are highly concentrated and should not be handled without protective goggles, rubber gloves, and preferably a rubber apron. The quantities shown will yield about 1000 CC or 1.05 quarts.

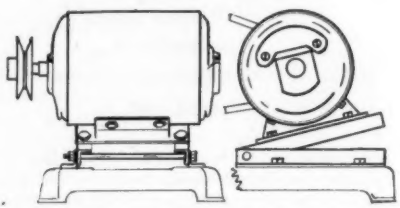
Mixing must be done in an earthenware crock because the mixing will liberate large quantities of heat. When cool, pour into a heavy glass bottle using a glass or non-metallic funnel. The bottle should be protected by a wood box or wicker case and capped with a rubber cork or plastic cap.

To use the solution, pour the amount needed into a glass bowl or cup. Clean the parts thoroughly of all grease, then suspend on a metal wire and dip into the acid. It will only require a few seconds to remove all oxides and leave a bright new surface. Remove from the acid and wash thoroughly in running water.—*Submitted by W. E. Patten, Baltimore, Md.*

EDITOR'S NOTE: Unless you have the facilities for mixing this solution and have a safe place in which to store it away from children, do not attempt to mix or use. Always have a sodium bicarbonate (baking soda) solution in an open pan readily available. Should you get any acid on your skin or clothes, soak the parts well with this solution to neutralize the acid.

AUTOMATIC BELT TIGHTENER
MADE FROM SCRAP

DUE to the short life of reclaimed rubber belts, we find that these belts will last considerably longer if they are kept at the proper tension. We, therefore, designed a motor mounting as illustrated in the accompanying diagram. This mounting can



be made from material found in most any shop scrap pile. It consists of 4 pieces of angle iron long enough to mount on the unit base and motor, a short piece of iron pipe and a long bolt and washers. Holes are drilled in the angle iron to the pipe diameter and the pipe is then inserted to form a hinge. The bolt with a washer at each end is put through the pipe to hold it in place.

Belt tension is held by the weight of the motor. If less tension is desired, the hinge holes on the motor angles can be drilled at a point nearer the center of gravity. The motor can be mounted at the center of gravity and a spring attached to the base will then supply the proper tension.—*Submitted by A. R. Pool, Bradenton, Fla.*

The Domestic Refrigerator of the Future

THE domestic refrigerator of the future was discussed by W. M. Timmerman, commercial engineer, General Electric Co., Bridgeport, Conn., before a meeting of the Baltimore-Washington Section, American Society of Refrigerating Engineers, held Thursday evening, January 4, at the Continental Hotel, Washington.

Before one of the largest crowds ever to attend a Baltimore-Washington Section meeting, Mr. Timmerman presented a factual analysis of the postwar domestic refrigerator, debunking some of the extravagant claims made in recent popular advertisements. These predictions, said the speaker, were usually made by people who know nothing about refrigerators and, he continued, the idea that the war, through some form of magic, has advanced the refrigerator to an ideal position was entirely baseless.

It is true, he said, that the war activities have not been a total loss to engineering and manufacturing. They have put engineers in a position to make contributions to the industry. Postwar, however, we will use the same equipment in general, but some materials will be different. Aluminum, for example, may be cheaper, but its use still presents a lot of problems. The refrigerator, the speaker said, is built to have a life of at least 15 years, and this thought must be borne in mind by the engineers when using different materials. A better job with a saving in cost is, of course, an essential but there are other problems to be considered.

Plastics

As regards plastics in the construction of a refrigerator, this is nothing new. We can build a plastic cabinet, and they have been built, but whether one can be built better and cheaper is, again, another problem.

Plastic doors are now being used and they have presented some problems. In other words, said Mr. Timmerman, plastics are no cure-all and the subject, in his opinion, has been greatly over-publicized. However, he did feel that there is a big field for plastics in motor insulation and we can look for their further use in this field, especially as cellulose is just now a weak point in insulation.

The speaker pointed out that when talking about the new refrigerator, we are quite apt to overlook the good job the refrigerator engineers have already done, and he presented figures showing that since the advent of the refrigerator in 1907, its cost, kilowatt hour consumption and noise level consistently have been reduced, while its available food storage space has been increased. The industry, in the opinion of the speaker, has done a good job for the public and needed no wartime urge to give it a kick in the pants.

Almost all manufacturers and many national magazines have conducted surveys to determine the wants of the public and these all seem to demand a bigger and better refrigerator. The demand for a larger box has been consistent, and in his opinion, this trend will continue, not necessarily larger cubical dimensions but increased food storage space.

More Storage Space

This, said Mr. Timmerman, presents a challenge to the manufacturers—to provide more food storage space without a corresponding increase in kitchen space occupied.

The surveys indicated, he said, that the high quality of refrigerator already attained must be maintained. And, he continued, the five year warranty is really a blessing in disguise as it causes the engineer to look twice before he changes even as much as a cotter pin.

Considering the hours of operation of the refrigerator in comparison with other motor driven devices, Mr. Timmerman presented an interesting figure for the washing machine which, he said, would have had to have been in use by Columbus in 1492 to have equalled the hours' operation of a refrigerator installed in 1929.

Another interesting point brought out by the speaker was that in these times manufacturers are frequently called on to produce what are considered as complicated machines for the war effort, when as a matter of fact, they are not as complicated as a refrigerator which involves chemistry, metallurgy and engineering both mechanical and electrical.

Discussing the popular subject of frozen foods, Mr. Timmerman said he did not feel

(Continued on page 72)

QUESTIONS AND ANSWERS

On Problems of Servicing, Installation and Maintenance of Household and Commercial Refrigerating Equipment—Send Your Problems to the Question Box.

COMMENTS ON QUESTION 545

IN CHECKING over my back issues of R. S. E., I find the dryer is not hooked up properly to require the refrigerant to flow through the dryer. Fig. 1 shows the original hook-up that accompanied the question. I

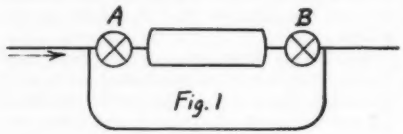


Fig. 1

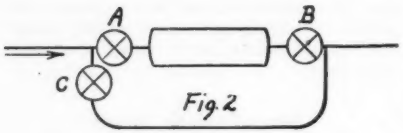


Fig. 2

contend the refrigerant will continually by-pass the dryer and carry moisture through the system. In order to prevent this, it will be necessary to install a valve in line B, as shown in Fig. 2. When the valve on the by-pass line is closed, all refrigerant must now pass through the strainer and dryer—J. P.

EDITOR'S NOTE: Since the original specifications called for no valve in the by-pass line, it is apparent that the designers felt that enough refrigerant would always pass through the dehydrator to accomplish the drying process. Obviously the amount of liquid by-passed will be controlled by the size of the by-pass line with relation to the main liquid line and the pressure drop through the by-pass in comparison to the pressure drop through the dryer.

COMMENTS ON QUESTION 636

IN REPLY to the soldering problem, I believe Easy-Flo solder is the solution. My experience has been very satisfactory in its use on most metals. This solder is made by Handy and Harmon who also make a flux to be used with it. Easy Flo requires less heat than Sil-Fos, follows the heat easily and flows well between two surfaces. I use it on copper to steel tubing joints.—*A. J. Levinson.*

COIL ARRANGEMENT IN COOLER

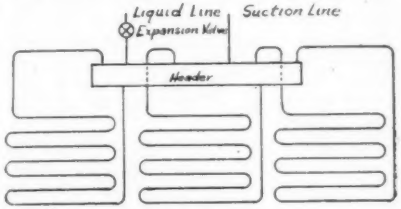
QUESTION 643: I had a butcher's walk-in freezer operated by a 3 hp. F6J air cooled Frigidaire compressor.

There are three sets of identical pipes occupying three walls of the room and one extra set which occupies the ceiling. The refrigerant is fed through two expansion valves from the top with extension downward. There is no heat exchanger on the system and also no oil return device. You will note that the coils are constructed in such a way that they are progressively spiralling downwards. In other words, their spirals are not parallel with each other and not parallel with the ground. I am unable to make this machine operate satisfactorily and have not been able to charge the plant with sufficient Freon dependent upon the numbers of feet of coil in operation. As soon as the correct quantity of Freon is charged into the plant, the head pressure developed to such an extent as to cause the high head overload to cut out at 240 lbs. 30 lbs. of Freon is the maximum I can put into this machine, which would give a reasonable head pressure and which will work to some extent, but not satisfactorily.

Another trouble is that in a very short period of time, piston discs break as well as flapper valve discs. The machine then has to be stripped and these items replaced. In less than a year, the valves and pistons are completely ruined and the pistons have to be replaced. The speed of the compressor is just on 500 revolutions per minute. Do you think that because the coils have a continuously downward slope that the speed of the refrigerant is so great as to cause the flapper and piston discs to give trouble, or do you think that if the coils are redesigned so that the long section would lie in a perfectly horizontal position, thereby retarding the flow or speed of the refrigerant, the coils would then have a certain holding effect on the refrigerant which would not tend to flow to the lowest end of the coils all the time?

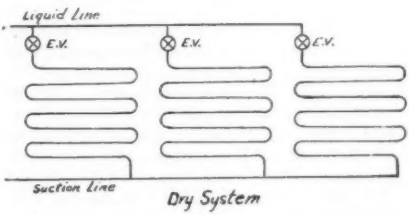
ANSWER: The coil arrangement on the butcher's walk-in cooler you have described is indeed a strange one in that it seems hard to determine whether it was intended to operate as a flooded system or a dry system.

Apparently the system was intended as a flooded system although some features of the coil arrangement would indicate the intentions to operate the coils as a dry system. How it will be operated in the future is a matter to be determined before making any changes. I have, therefore, included two sketches showing a hook-up for either type of system.



Flooded System

The main trouble at present is that the refrigerant is trapped in its circuit through the coils which permits quantities of liquid refrigerant to gather at the bottom of the coil then pass over to the suction line in slugs which when passing through the compressor will break the suction and discharge valves. Furthermore, because the coils will not operate on a thoroughly flooded condition you are unable to get the amount of refrigerant into the system usually required in a flooded system. In attempting to do so you are overloading the condenser and receiver of the condensing unit to the point where the effective area of the condenser is reduced and the head pressure rises far above normal.



Dry System

In order to have a thoroughly flooded condition I would suggest that you refer to the attached pencil sketch marked "Flooded System," in which you will note I have provided a large header from which the three coils are fed with liquid refrigerant and to which the return from each coil enters the top. Liquid refrigerant passing through the coil may be separated from vapor refrigerant and returned to the coil with this arrangement. This assures the coil being filled at all times with liquid refrigerant while the vapor has an opportunity of separating and being drawn into the suction line. Both the liquid lines and the suction lines from the machine enter this large header.

In the arrangement of the four coils I would suggest that the coil mounted on the ceiling be fed separately by one expansion valve while the other three coils on the wall be grouped as shown in this sketch. The header should be in the neighborhood of a three or four inch pipe providing sufficient size, so that the velocity of refrigerant entering would be not more than 200 feet per minute. It is necessary, too, to have a large size header so that separation of liquid and vapor can take place and liquid is not drawn into the suction line unless the coils and header are thoroughly flooded to the level of the suction line.

If you prefer converting to a dry system which has the advantage of containing much less refrigerant it would be necessary to use four separate expansion valves feeding each coil individually as shown in the sketch marked "Dry System." Here it is possible to extend this liquid line to each evaporator in series and then connect each suction line from each coil to a common header from which one suction line could return to the machine. In this sketch I have shown only three coils but the fourth coil on the ceiling would also be connected in the same manner, being fed by a fourth expansion valve. It is necessary, of course, to use thermostatic expansion valves on each one of these coils because automatic expansion valves can not be regulated on a multiple setup of this nature.

UNEVEN TEMPERATURES IN FRIGIDAIRE I. C. CABINET

QUESTION 644: I have serviced a Frigidaire portable ice cream cabinet in which the temperatures are too low at the far end from the unit and too high at the unit end. I added one pound of Freon-12 and opened the expansion valve some but seemed to get no better results. The owner tells me that the temperatures have always been the same as I have explained them. The cabinet is a 12 hole and the unit number on model is 2091048-F2CP. What must be done to correct the trouble?

ANSWER: The cabinet you refer to is one of two models, namely: P-1257 or P-60. The

P-1257 was made in 1937 and the P-60 in 1938. Both of these are 12 hole powered by a F2CP unit. The unit number designates F-12 as the refrigerant, using a #2 compressor body, powered by a 1/3 h.p. motor, and installed in a portable (P) Cabinet. The automatic expansion valve is model AEV-10. Refrigerant is fed to the far end of the coil first and feeds back around each separate compartment. The refrigerant charge for these cabinets is: P-1257, 144 ounces; P-60, 128 ounces.

In all probability, the system is not fully charged. Setting of the expansion valve should be at the highest possible pressure to still maintain the desired temperatures. If you desire a cabinet temperature of 5°F., the valve can be adjusted to about 9 lbs. pressure. The thermostat will have to be adjusted to cut out at the desired pressure and then adjust the AEV to completely frost the coil. Adding refrigerant should be done by admitting small quantities intermittently until fully charged.

PURIFYING METHYL NOT PRACTICAL

QUESTION 645: I know the effect of methyl chloride on aluminum and that methyl chloride when exposed to aluminum will produce a gas that can be spontaneously flammable in open air, but I don't know if this methyl chloride can be used again. It doesn't seem reasonable that it should be.

I had a case recently where aluminum suction valves were entirely destroyed, due to conversion to methyl without proper inspection. This unit has about 50 pounds of refrigerant still in it. Rather than take chances with it, it was discharged to open air. Was this right or wrong?

I would appreciate very much knowing just what happens to mehtyl under these conditions. Is it still efficient refrigerant or has it lost something due to chemical actions? I don't seem to be able to find any articles that deal with this phase of the subject.

ANSWER: (By Dr. Walter O. Walker, Ansul Chemical Co.) It would not pay to try to reclaim methyl chloride which has become contaminated with flammable aluminum compounds principally due to the hazard involved. The aluminum-methyl compounds which are formed by the action of methyl chloride on aluminum solidify from methyl chloride solutions and consequently there would be some danger that an expansion valve might become plugged due to solid aluminum methyl compounds separating at the expansion valve, in a fashion similar to that followed by ice or wax. Because of this possibility, methyl chloride containing aluminum methyl compounds should certainly not be used in a machine.

We, as a company, would not want to even attempt to purify methyl chloride contaminated with aluminum methyl compound and we most certainly would not advise anyone to attempt to purify methyl chloride. This advice is based entirely upon the hazard involved in such purification even by competent operators who are acquainted with all of the details of the behavior of these compounds.

To sum it all up, if methyl chloride becomes contaminated with aluminum methyl compounds, all of the refrigerant should be removed from the machine and the machine overhauled to be certain that none of the aluminum methyl compound remains behind in it. If the machine is gassed off the flammable aluminum methyl compound will tend to concentrate in the machine. It would, therefore, be necessary to remove these compounds. A preferable method of removing the refrigerant would be to take it out as a liquid in which case practically all of the aluminum methyl compound would be removed along with the refrigerant. The machine should then be washed with a small amount of methyl chloride which, in turn, should be removed as a liquid, after which if there was no other contamination of the unit, a normal charge of oil and methyl chloride should be added.

WHO MADE WARD UNIT?

QUESTION 646: I am in need of parts for an old model Montgomery Ward unit. This unit has the compressor and motor on the same shaft. The compressor seal is at the common bearing between the motor and seal and a fan is at the other end of the motor. The following is the complete information on the box: Unit Serial No. W28083; Model WF1300; Cabinet Serial 18238, Model MW. Could you tell me who made this unit?

ANSWER: I believe that Montgomery Ward will supply you with parts and information on their refrigerators. Should this fail, I would suggest that you write to Gibson Electric Refrigerator Corporation, Greenville, Michigan. According to our data, this machine was manufactured in 1932 and the Gibson twin cylinder direct drive 1/3 hp. unit was used in the Ward refrigerator of that model.

COPELAND BRINE TANK SOLUTION

QUESTION 647: I have been unable to find the information on the ingredients for brine used in the Copeland refrigerator. Several formulas have been given to me but I have very little success with them as each one liberates too much heat when mixed or it requires too long to cool them down. What is the recommended thermostat setting for these refrigerators?

ANSWER: According to the Copeland service manual, these old brine tank models have an alcohol brine in them. The solution is one part denatured alcohol to two parts water. The water need not be distilled.

You will find heat is liberated in the preparation of any salt brine. However, the brine when cooled after mixing will not be more difficult to reduce in temperature than the alcohol brine. In fact, pure water will require longer to cool at a given rate than any solution containing water as one of its ingredients. Conversely water will not warm up as fast as does a brine because it will absorb more heat per degree rise in temperature.

The thermostat on this Copeland should be set to cut out at 19°F. and cut in at 26°F.

EXTREME CONDENSER COOLING

QUESTION 648: In this district we have no water meters, and when we install a water cooled machine, we generally take off the water controlling valve (to save us trouble). In the summer the water at the hottest is 68 degrees, but in the winter the water gets down to 34 degrees. So, is there any disadvantage to have very cold water running all the time? For my part I have thought that the coldest we can get the receiver the most refrigeration we get.

ANSWER: In answer to your question about the water temperature through the condenser, it is well to consider the pressure-temperature relationship of the refrigerant. The capacity of an expansion valve is lowered as the difference in pressure between the high side and low side is decreased. This is due to the rate of flow through the valve orifice. The rate of flow through any orifice, whether it be expansion valve or float valve, will be reduced. It is true that capacity is increased by reducing the temperature in the liquid line but such a reduction does not reflect on the condenser pressure. You may experience some difficulty in getting proper refrigeration of the fixture because the machine will not cycle normally if it is pressure controlled.

FALSE SIGHT GLASS READING

QUESTION 649: Do we get the right reading when we install a ⅜ in. sight glass on ¼ in. liquid line, for SO_2 or Freon. Recently I had a job, which was an SO_2 job, with ½ H.P. compressor, having a ¼ in. liquid line. We put on it a ⅜ in. sight glass, and the sight glass was not showing full; so, we added up gas until the sight glass was full, then the head pressure ran up high enough to close the motor. In other words, the head pressure was too high. And take my word, there was no air. By taking off gas to bring back the head pressure to normal, again the sight glass showed half full.

ANSWER: The results are difficult to understand unless the condenser on this unit is cooled by very low temperature water. If the condenser pressure is low and the liquid line is warmer than the receiver, then the refrigerant will "flash" (change to a gas) in the line. Increasing the pressure in the receiver by adding gas, no doubt, prevented flashing of the liquid. If the installation of a large sight glass showed vapor, we could also expect a dryer or strainer in the liquid line to have similar results.

OPERATING HEAD PRESSURE

QUESTION 650: Will you kindly let me know the proper head pressure for a Methyl Chloride system operating in a room temperature of 75 degrees; back pressure on the automatic expansion valve set at four pounds. Some manufacturers in their instruction book claim this is too high and head pressure should be set at about seventy pounds which I am sure is too low. Your handy pocket calculator shows a much higher back pressure than either of these. This unit is now operating at 90 lbs. head pressure.

ANSWER: According to my calculations, the head pressure for a methyl chloride machine operating in a 75° room with a back pressure of four pounds should be in the neighborhood of 102 pounds.

Seventy pounds pressure is indeed very low unless the machine is water cooled and unless there is more water than necessary passing through. Different manufacturers may vary in their instructions for their particular machine because the head pressure of any machine will vary in accordance with the installed area of condensing surface. Actual operating pressures sometimes may be slightly higher and could be considerably lower depending on the amount of condensing area on the machine. Pressures indicated by the calculator are average.

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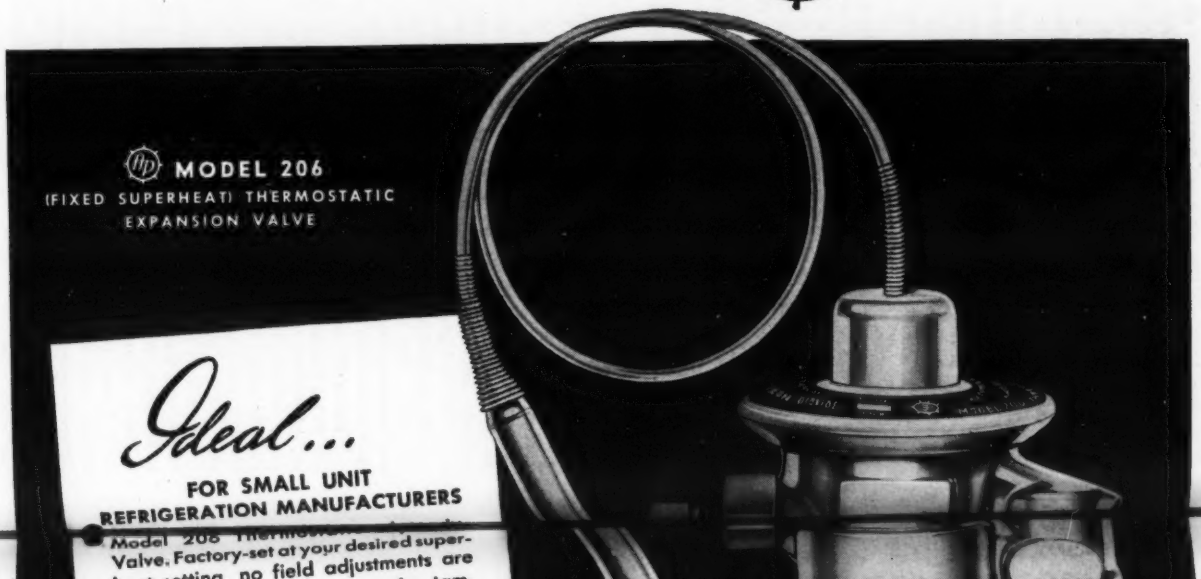
IT'S *BUILT INTO* EVERY (fp) VALVE



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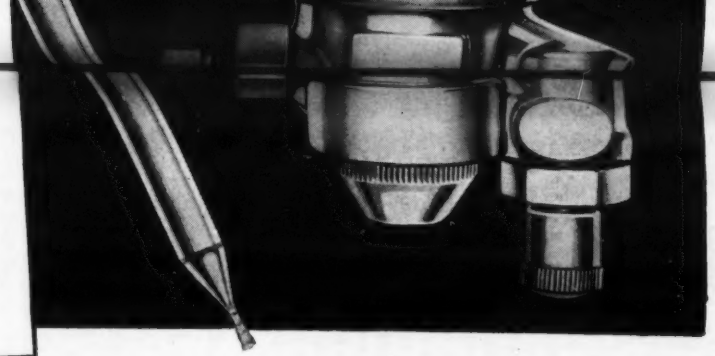
Model 206 Thermostatic Expansion Valve. Factory-set at your desired superheat setting, no field adjustments are required, and the valve remains tamper-proof. Built under rigid factory inspection — with all parts microscopically examined and thoroughly tested during and after fabrication. Install Model 206 with full confidence in any application where the superheat setting has been predetermined.



Wherever a non-adjustable expansion valve is required, or preferred, the A-P Model 206 is best. Absolutely reliable and dependable, it maintains a constant superheat over a wide range of evaporator temperatures — a real advantage in this type of valve. Its maximum capacity — 0.61 tons Freon; 1.32 tons Methyl or Sulphur.

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DEPENDABLE REFRIGERANT VALVES

Stocked and Sold by Progressive Refrigeration Jobbers Everywhere — Recommended and Installed by Leading Refrigeration Service Engineers.

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- ★ Three orifice sizes
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- ★ Small size for hard-to-get-at applications
- ★ Factory-set superheat 10; 5 to 15 degree available range
- ★ Free acting diaphragm

Use of the Sterilamp for Perishable Foods

BACTERICIDAL ultraviolet lamps now make it possible to preserve perishable foods safely under humidity conditions so high that the edibles otherwise would be fertile fields for spoilage and mold, according to Dr. Arthur W. Ewell, refrigeration research specialist who spoke at a recent meeting of the New England Section of the American Society of Refrigerating Engineers. Dr. Ewell is consultant to the Westinghouse Lamp Division at Bloomfield, N. J., and retired physics professor at the Worcester (Mass.) Polytechnic Institute.

Application of Sterilamp

This electronic guardian in storage spaces is the Sterilamp ultraviolet tube, a device which resembles a slenderized fluorescent lamp and kills bacteria and mold either on food surfaces or afloat in air. Dr. Ewell described as a striking application of the use of Sterilamps their role in a patented process for the rapid tenderization of beef. He explained that by raising the temperature in the beef aging room, protected by lamps, from 36 to 60° F, the time required for the natural process of ripening is reduced to about one-tenth of the time previously required. Without a bactericidal agent such as the lamp's ultraviolet rays, the high temperature combined with the high 85-88 per cent humidity necessary to prevent surface drying and accompanying injury to the meat would result in surface mold and slime, causing serious shrinkage. A similar result is attained in other food storage and processing rooms where bactericidal ultraviolet lamps are installed, he said.

As an example, he cited the experience of cheese aging in rooms protected by the lamps. To reduce dehydration, a relative humidity of 80 per cent is desirable. To speed the ripening, the temperature is raised to an average of 45-50 degrees, about 15 degrees higher than in unprotected aging rooms. Thus, the lamps not only permit the acceleration of the cheese ripening process to a fraction of the time previously required but also reduce shrinkage by dehydration.

In addition to the bactericidal rays, the lamps produce in the air a small amount of ozone, a colorless, gaseous form of oxygen used commercially for the purification of water and foods, particularly in egg and apple storage rooms. Despite the fact that Sterilamp rays are scattered over a wider area than visible light rays, there are hard-to-reach surfaces in food storage and food processing rooms which elude the ultraviolet. So the ozone, which in effect scatters rapidly from the lamp and is circulated throughout the storage space, steps in as an additional weapon to halt mold growth. At the same time, the ozone concentration in food storage and processing rooms properly equipped with the bactericidal lamps never exceeds a few tenths of one part per million of air, which is too low to injure even sensitive foods.

Radiations

Radiations emitted by the lamps are much more powerful as a bactericidal agent than the ozone. At 10 feet from the 15-watt Sterilamp direct radiation will destroy in one hour practically 100 per cent of the common bacteria, such as B Coli, and it will destroy 50 per cent in 12 minutes. To accomplish the same result with ozone so heavy a concentration would be required that it would be unsafe to enter the room except for a very few minutes.

S S S

YANKS HAVE ICE, THANKS TO JAPS

THE luxury of ice on one of the Pacific's hot and humid islands has been provided for Navy Seabees by W. T. Weber, chief machinist's mate, of Colusa, Calif., but it isn't as easy as it sounds.

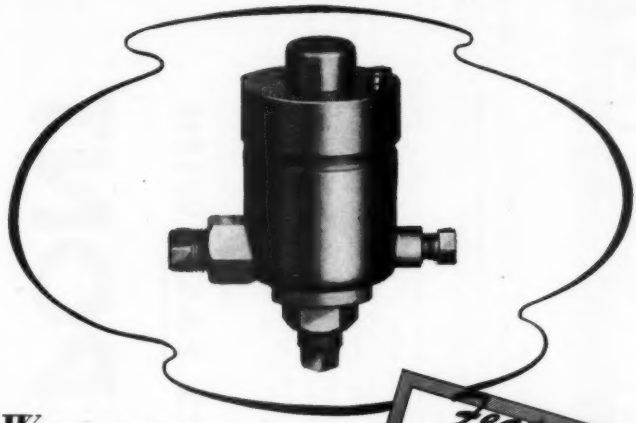
The basic element of Webers Goldbergian ice maker is a large tank, taken from Jap soldiers, who chose to defend it but didn't live to rue the act.

Resembling a mountain whisky still, the device produces 300 pounds of ice daily. Comments Weber: "There's no sense in taking a picture of the thing—people wouldn't believe it anyhow."

There is considerable doubt in Weber's mind as to the specific use it had in Japanese hands, but as long as it makes ice, he doesn't debate the question.

CONSTANT

CONTROL WITH *Temprite* VALVES



WHEN Temprite Constant Pressure Two-Temperature Valves are used, constant temperatures are assured at all times and the performance of the refrigeration system is greatly improved.

Sensitive operation, perfect sealing seat and rugged construction are essential features for a satisfactory two-temperature valve and it is these features that account for the Temprite Valves' unfailing performance.

The Temprite Two-Temperature Valve is an essential part of any multiple type refrigeration system and is also recommended for use on single applications where closer and more constant regulation is required than can be furnished by the condensing unit control switch.

No refrigerating system is better than its control; that's why the Temprite Constant Pressure Valves are preferred by refrigeration engineers who recognize their outstanding performance in general commercial work.

Features

1 Easy to adjust
2 Easy to install
3 Wide range of adjustment
4 Close temperature control
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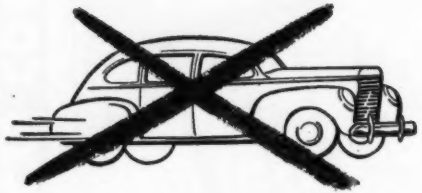

SOME REPLACEMENTS ARE TOUGH TO MAKE . . .

BUT IT'S EASY WITH

DU PONT METHYL CHLORIDE!

DU PONT METHYL CHLORIDE, 99.5% PURE, can meet your every need. Dependable as an original charge, for recharging, and as a completely satisfactory replacement for refrigerants that are scarce or unavailable.

ORDER WHAT YOU NEED, but don't stock up. You can get Du Pont Methyl Chloride quickly when you need it from stocks in principal cities. ASSURE yourself rapid deliveries by *returning empty cylinders promptly!*

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ELECTROCHEMICALS DEPARTMENT
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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Du Pont Methyl Chloride—Specifications

Purity	99.5% Methyl Chloride
Moisture	0.008% by wgt. max.
Acid (as HCl)	0.001% by wgt. max.
Residue on Evaporation	0.01% by wgt. max.
Boiling Range (760mm)	—24.6° to —23.6°C.
Color	water white, clear

REPLACEMENT TIPS—

1. Make sure system is thoroughly clean and dry before installing Methyl Chloride.
2. Allow for the fact that Methyl Chloride, per unit volume, weighs less than most other refrigerants.
3. Control (*i.e.*, capillary) tubes should be made smaller to allow for Methyl Chloride's lower viscosity, lower resistance to flow through pipes.
4. Speed up the compressor 5–10%, to handle increased volume of vapor.
5. Maintain dryness of refrigerant, system and lubricating oil at all times. Use *DRY* Du Pont Methyl Chloride.
6. Don't use Methyl Chloride with die castings, aluminum, zinc or magnesium and its alloys.

DU PONT ELECTROCHEMICALS

Shipbuilders Study to Become Refrigeration Service Men

Men in the San Francisco Bay Area receiving instructions in refrigeration service from John M. Schlemmer (extreme left).

IN anticipation of many jobs that will open to shipbuilders for installation and service on refrigeration equipment used aboard ship, the men in the San Francisco Bay Shipyards have undertaken to train themselves as refrigeration service men.

Classes have been started under the auspices of the War Production Training Program at 1663 Mission Street, San Francisco, Calif. The men meet on Monday or Thursday night for a two-hour class. John M. Schlemmer of General Air Conditioning and Heating Co. is in charge of the training program. The course will of necessity extend over a period of many months to cover the field, starting with the theory of refrigeration and continuing with the practical service work and study of the field by going into types of equipment and the installation and maintenance of refrigeration systems.

WRIGHT LEAVES REFRIGERATION CORP. OF AMERICA—HAS CHARGE OF REFRIGERATION SCHOOL

ANNOUNCEMENT is made by L. K. Wright of New York City that he is now in charge of the refrigeration course conducted by the Y.M.C.A. Trade and Technical School, 5 West 63rd St., New York City. Mr. Wright resigned his position as chief engineer for the Refrigeration Corp. of America to accept this new position.

The refrigeration school, which Mr. Wright started in 1932, has plans for the intensive training of refrigeration service men operating under the University of the State of New York. The courses are being rewritten, the shop extended and preparations made in the selection of a staff to teach refrigeration to both civilian and G.I. students.

Mr. Wright will also be available as consultant for the development of new designs, apparatus, equipment and processes. His experience in locker plant designs and layouts, as well as experience in designing low temperature equipment, will be extended to those desiring designs or advice of that nature.

L. K. Wright is a well known author in the refrigeration field and has written several books. He has been a frequent contributor to THE REFRIGERATION SERVICE ENGINEER and his past experience has included refrigeration training for G.I.'s at Camp Lee, Va.

Make a note of the refrigerating machine with a future!

WHAT'S BEHIND THIS rapidly growing preference for G-E "Scotch Giant" Condensing Units? Some good reasons which, in times like these, take on new importance—for you.

TAKE RUGGEDNESS. You refrigeration service engineers, especially, know that G-E "Scotch Giant" Condensing Units are sturdy ... built for a long life.ime of dependable performance.

OR EFFICIENCY. Everyone knows, of course, about the high refrigeration output and low current consumption of G-E "Scotch Giants"—*under a wide range of actual operating conditions.*

WORTH REMEMBERING. Wherever dependable, efficient and long-life refrigeration is needed, there's another spot for a G-E "Scotch Giant" Condensing Unit—the refrigerating machine with a future.

* * *

"Scotch Giant" Condensing Unit

General Electric Company, Air Conditioning and Commercial Refrigeration Divisions, Section 47111, Bloomfield, New Jersey.

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GENERAL ELECTRIC

Commercial and Industrial Refrigeration

NEW SELF-SERVICE CABINET DESIGNED FOR FROZEN FOODS

THE development of a self-service frozen food display refrigerator has been announced by Hussmann Refrigeration, Inc., sales subsidiary of Hussmann-Ligonier Co., manufacturers of refrigeration equipment. This new refrigerator, as shown in the accompanying picture, permits display of perishable foods of all types, meats, vegetables, dairy products, under proper conditions and refrigeration. The display in these open refrigerators makes it unnecessary for the customers to slide or open doors to obtain the merchandise. These Open Self-Service Refrigerator Display Cases give the same refrigeration service as do conventional closed cases.

Display of Foods

By means of this unit frozen foods can be displayed within clear view and easy reach of customers. They may be seen through a glass front from any part of the store. Mirrors are not used to show the merchandise but merely to add mass and sales appeal to the display. The products can be reached without the necessity of moving slide doors or lift type doors. The case is so designed as to eliminate the need for reaching down into the refrigerator for merchandise as must be done with many other types.

While this frozen food display case cannot be produced now, the Company advises it has conducted exhaustive tests in stores which have proven this display case possesses all the requirements necessary for the refrigeration of Frozen Food Products with open clear view display. It is fully covered with patents granted or pending.

Production at this time is dependent upon removal or revision of restrictions by The War Production Board.

Self-service frozen food display refrigerator made by Hussmann.

S S S

A. D. Nerber,
Texas.

Here is my renewal for my subscription in advance. I don't want to take a chance on missing any copies of this helpful magazine. Sorry it isn't published more often.

A.S.R.E. TO PUBLISH ABSTRACTS

APPOINTMENT of J. Mack Tucker, associate professor of mechanical engineering at the University of Tennessee, as editor of the new A.S.R.E. Refrigeration Abstracts publication was made at the 40th Annual Meeting of the American Society of Refrigerating Engineers by A. B. Stickney, retiring president.

As an active member of the A.S.R.E. and contributor of articles and data for Refrigeration Engineering and the Refrigerating Data Book, Mr. Tucker is well qualified to head this new publication. Refrigeration Abstracts will be useful to research men and those engaged in the other branches of the refrigeration industry.

S S S

DEALER'S PRIORITY SUSPENDED

THE war production board has announced that priority privileges of Winston Wyatt, Inc., dealer in commercial and domestic refrigerators and other appliances of Norfolk, Va., have been suspended until May 10 for violation of order L-38.

W.P.B. states that the firm accepted deliveries of "six new industrial or commercial refrigerating or air conditioning systems" on orders not approved between Dec. 14, 1943, and Aug. 1, 1944, and during the same period, they sold nine systems on unapproved orders.

...a name to remember when you think of BETTER lathes

A lathe is judged by the kind of job it does, and by nothing else. That one fact explains why Logan Lathes have made such headway. The men in the shops, and the executives as well, *like* the kind of job that Logan Lathes do. Here are four reasons why:

- Advanced engineering in the spindle mounting, in the countershaft, in the back gear arrangement, in the bed construction, and in many other points.
- More exacting standards and closer tolerances are maintained in building Logan Lathes.
- Logan Lathes are built in a new, modern factory, equipped with the best machinery and tooling obtainable.
- A management policy, stressing quality of production rather than volume that has produced a personnel of loyal workers.

Further messages in this series will give you more reasons why it will pay to see your Logan dealer or get the Logan catalog before you buy a lathe.

LOGAN ENGINEERING CO.

CHICAGO 30, ILLINOIS

A-2

a name to remember when you think of BETTER lathes

GUESSWORK ELIMINATED IN FREEZING PLANTS

ELIMINATING the guesswork in calculating the size of a freezing plant has been accomplished by two University of Texas mechanical engineers, Dr. Byron E. Short, and Dr. Luis H. Bartlett.

By means of an experimental determination, Dr. Short calculated the size of refrigerating plants necessary to freeze foods, and by means of mathematical and thermodynamic determinations, Dr. Bartlett made similar calculations. Their results were almost identical.

Material covered in the experiment includes work done over a period of three years on the determination of the specific heats and the freezing region of a number of sugar solutions, fresh fruits, vegetables, meats, seafoods, and other important foods.

"Our calculations will show exactly what size to make the refrigerating machines for certain fruits, vegetables, and meats," Dr. Bartlett said. "By cutting out the guesswork in the size, both time and money will be saved."

Heretofore, Dr. Bartlett explained, calculations made in 1892 have been used for freezing units, and often the plants were either too large or too small.

BUILDING CONTRACTOR CHARGED WITH DIVERTING UNITS

THOMAS J. BOYER, general building contractor, 8518 S. Ashland, Chicago, is charged with diverting 31 new domestic refrigerators from defense housing projects. He is faced with a suspension order until April 13, 1945, during which time he will be denied material allocation and priorities assistance under terms of Suspension Order 5-676 reported by the Compliance Division of the W.P.B. Charges are based on violation of W.P.B. Supplementary Limitation Order L-5-d which restricts transfer and establishes procedure for obtaining new refrigerators.

NRSJA OPENS CINCINNATI OFFICE

THE new offices of the National Refrigeration Supply Jobbers Association are now opened at 920 East McMillan Street, Room 202, Paramount Building, Cincinnati 6, Ohio. H. S. McCloud is the Executive Secretary in charge of the offices and is being assisted by Mary E. Silvers.

MANPOWER—CRITICAL COMMODITY

(Continued from page 25)

Bulletin Issued by N.R.S.C.

W. R. Kromer, Director of the National Refrigeration Service Council, 1883 East 24th Street, Cleveland 14, Ohio, has recently issued a bulletin reviewing some of the details necessary to keep refrigeration service men in their field. Mr. Kromer officially resigned as Director of N.R.S.C. on January 1st but is giving generously of his time pending action of the council.

Although the training activity of the N.R.S.C. has been completed and mechanics are well under way in every community requiring such a program, the related manpower problems are still in evidence in some communities. Some local Draft Boards are attempting to force skilled refrigeration mechanics into direct war work. The national coordinators, who are assistants of the Director, are showing their willingness to intercede in behalf of the service men.

If no coordinator is functioning in a community, Mr. Kromer indicates that action taken by a mechanics Draft Board to force him into direct war work will be given consideration by informing Mr. Phil Redeker, Selective Service Coordinator, 5229 Cass Ave., Detroit. Mr. Redeker will appeal to Washington to correct impressions of the local Draft Board. The name and address of the local coordinator can be obtained by writing Mr. Kromer at his Cleveland address.

EMERSON E. RASOR MEETS DEATH IN PLANE CRASH

THE tragic death of Emerson E. Rasor, Building Engineer and Chief of Maintenance for Lear, Inc., of Piqua, Ohio, came as a shock to all R.S.E.S. members who knew him. He was on a business trip for Lear, Inc., when the plane in which he was traveling crashed.

The Lear Company is engaged in the manufacturing of aircraft equipment. He was an accomplished electrician and was known for his excellent workmanship both in the repair and construction field. At the time of his death, he was not active as a refrigeration serviceman; however, he still retained his membership in the R.S.E.S. by being a member of Dayton Chapter No. 1.

Mr. Rasor leaves his widow, two sons, a daughter, and his parents. His passing is also deeply felt by the members of Dayton Chapter.

NOT AFFECTED BY ★ ATMOSPHERIC PRESSURE

In the stratosphere or at sea level, in a mile-high airplane or on a tropical isle, White-Rodgers Hydraulic-Action controls *never* need adjustment or recalibration.

The completely sealed solid-liquid charge of the Hydraulic-Action element is tested before it leaves our plant, and will perform as calibrated no matter where you install it.

8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.

2. Hydraulic-Action principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.

3. Diaphragm motion uniform per degree of temperature change.

4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.

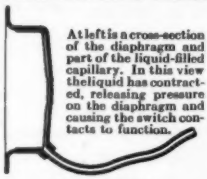
5. Heavier, longer-wearing parts are possible because of unlimited power.

6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.

7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.

★ **8.** Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.

NO MATTER WHERE YOU PUT THEM HYDRAULIC-ACTION CONTROLS ALWAYS ARE ACCURATELY CALIBRATED

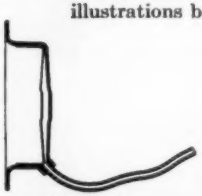


At left is a cross-section of the diaphragm and part of the liquid-filled capillary. In this view the liquid has contracted, releasing pressure on the diaphragm and causing the switch contacts to function.

CONTRACTED

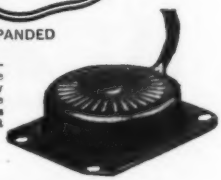
Not having to worry about adjustments—fewer service calls—are advantages White-Rodgers Hydraulic-Action controls can give you. How this is done is shown in the illustrations below.

In this cross-sectional view, the liquid charge of the capillary has expanded with a rise in temperature. The positive force of this hydraulic action forces the diaphragm outward and causes the switch contacts to function.



EXPANDED

Illustration of the White-Rodgers diaphragm body, the actuating element of every White-Rodgers temperature control. It is so designed as to exert FULL pressure at the point of contact with the switch mechanism.



WHITE-RODGERS ELECTRIC CO.

1203B CASS AVENUE ST. LOUIS 6, MISSOURI

Controls for Refrigeration • Heating • Air-Conditioning

Refrigeration Service Engineers Society

Official Announcements of the activities of the International Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

INTERNATIONAL HEADQUARTERS: 433-435 North Waller Ave., CHICAGO 44; ILL.

E. A. PLESSKOTT RETIRES AS R.S.E.S. PRESIDENT

ERNEST A. PLESSKOTT, St. Louis, Mo., International President of the Refrigeration Service Engineers Society since 1941, tendered his resignation to the Board of Directors effective January 31, 1945. Because of urgent business matters, he had indicated the necessity for this decision several months ago. Reluctantly the Board of Directors acceded to his request.

E. A. PLESSKOTT
Retiring President, R.S.E.S.

Mr. Plesskott has been an active member in the affairs of the Society since its inception. His tireless energy in contributing to the advancement of the international association as well as his local St. Louis Chapter, soon brought recognition from his fellow members.

As a charter member of St. Louis Chapter in 1933, Mr. Plesskott served as treasurer during its formative period and was elected vice president when the chapter received its charter in June, 1934.

In 1935 he was elected secretary and in 1936 president. Upon retiring from the presidency he was again elected secretary and served in that office until 1940.

At the Detroit annual meeting in October, 1935, he was elected to his first position in the international society as a member of the Board of Directors. In 1936 he served as sergeant-at-arms and in 1938 he was elected to the position of second vice president. In 1940 he advanced to the first vice presidency and was elected international president in 1941.

During his tenure of office, the society made rapid advancement, doubling its membership and increasing the activities of the various committees for the benefit of its membership. The war years brought added responsibilities to his administration and these problems were met with his usual far sighted judgment. His experience, knowledge and requirement of the service business provided the necessary background to formulate the program of association activities.

In the past few years he has devoted much of his time to representing the refrigeration service men in conferences held in Washington, D. C., and advising the Government agencies on the needs of those engaged in keeping the refrigeration equipment running during this emergency.

Pending the formal election of his successor, 1st Vice President Clarence Buschkopf, Beaver Dam, Wis., will serve as acting president.

Announcing the

NEW LINE of PAR CLOSE COUPLED UNITS

PAR BY *Lynch*

Now "PAR" Condensing Units are available in—

- . . . 1/6 and 1/4 H.P. Domestic Models
- . . . 1/4, 1/3 and 1/2 H.P. "Close Coupled" Air Cooled Commercial Models for self contained application
- . . . 1/4 to 2 H.P. Heavy Duty Air Cooled Commercial Models
- . . . 1 to 5 H.P. Heavy Duty Water Cooled Commercial Models

All Par models are designed and built to assure economical, efficient refrigeration and the many outstanding features of construction and operation make Par a leader for extra years of trouble-free service. Ask your Par Jobber for more complete details on the Par line of condensing equipment or write for Par Catalog R-96 and supplement R-96-A that carry illustrations, specifications, and capacities of all Par models.

PAR—Commercial Condensing Unit Line sold exclusively through Franchised Refrigeration Supply Jobbers!

. . . . *By Comparison — You'll Buy PAR*

PAR Lynch DIVISION

Manufacturing Corporation, Defiance, Ohio U. S. A.

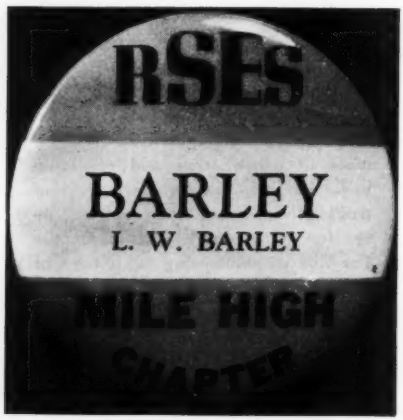
BIRMINGHAM CHAPTER PETITIONS FOR CHARTER

AT a meeting held January 20 in the Refrigeration Supplies Distributor offices, Birmingham, Ala., a group of refrigeration service men discussed the formation of a Chapter to the R.S.E.S. Ninteen men signed a Petition for Charter.

Several members-at-large were present to give a helping hand throughout the formative stages of the Chapter. C. S. Tucker, a member-at-large, was chosen Temporary Secretary to transact the business for those desiring to affiliate themselves with the International Society.

MILE HIGH CHAPTER BADGES

FOR the past few months members of the Mile High Chapter, R.S.E.S., have been wearing introduction badges at their meetings. The badges have enabled the men to become better acquainted among themselves. New members soon learn the names of the older members and the new members are soon being addressed by their nicknames.



The identification button illustrated here shows the nickname of L. W. Barley in large letters above his name. Guest badges are also presented to non-members attending a regular meeting. The badges immediately show who is a potential chapter member and someone usually approaches the visitor. At the conclusion of the meeting, all badges are turned in to be available for the next meeting.

The Chapter also has secured small lapel buttons that are given to any member who contributes to the interests of the Society by giving an educational talk at one of the meetings. These lapel buttons are plainly marked "Merit," together with the identifying R.S.E.S. initials and the words "Mile High Chapter."

INTERPROVINCIAL ASSOCIATION COMPLETES PLANS FOR ANNUAL MEETING AT MONTREAL

PLANS for the Sixth Annual Educational conference of Canadian Chapters of the Refrigeration Service Engineers Society are in the final stages of completion. This two day conference, sponsored by the Interprovincial Association will be held in the Mount Royal Hotel, Montreal, Sunday and Monday, March 18 and 19. Mount Royal Chapter will be hosts to the meeting.

The annual conference is assuming greater importance each year in the Canadian refrigeration industry and a large attendance is expected at this meeting to discuss current problems.

R.S.E.S. Chapter Notes

ELM CITY CHAPTER

New Haven, Conn., Jan. 4—Fred Binns of the Virginia Smelting Company was guest speaker for the evening. He gave an interesting story on how the various kinds of Freons are obtained from methane gas and why it was easier to identify each of them by a number rather than by the many different chemicals used in their production.

About thirty-five members of the War Production Manpower Training School on Refrigeration were guests and they, with about thirty Chapter members present made this a good attendance. The meeting was concluded with many interesting questions.

CHICAGO CHAPTER

Chicago, Ill., Jan. 9—The regular meeting was attended by over 60 members and guests who thoroughly enjoyed the educational feature of the evening presented by W. H. Eickmeyer, service manager of Lynch Mfg. Co., manufacturers of Par condensing units. Mr. Eickmeyer spoke on low temperature applications. Refreshments were by courtesy of Lynch Mfg. Co., and Automatic Heating and Cooling Co.

The following officers were elected at this meeting: *President,* Floyd Lilley; *First Vice-*

Improved REFRIGERATION DRYERS

Weatherhead dryers using Silica Jel are made in both the rechargeable and non-rechargeable types. No felts or organic filters are required. Instead, a generous number of fine mesh stainless steel screens are used. Full flow is assured even at zero temperatures. The Weatherhead line of *improved* refrigeration products is available now.

Look Ahead with

Weatherhead

THE WEATHERHEAD CO., CLEVELAND 8, OHIO

Plants: Cleveland, Columbia City, Ind., Los Angeles, Canada—St. Thomas, Ontario

BRANCH OFFICES: NEW YORK • PHILADELPHIA • DETROIT • CHICAGO • ST. LOUIS • LOS ANGELES

In addition to refrigeration dryers, Weatherhead also manufactures complete lines of valves, manifolds, fittings, drain cocks and other products for the following industries:

AUTOMOTIVE ★ REFRIGERATION ★ FARM EQUIPMENT

RAILROAD ★ MARINE ★ ROAD MACHINERY

DIESEL ★ L. P. GAS ★ APPLIANCE MANUFACTURERS

president, Fred H. Stevens; *Second Vice-President,* Ed Riccio; *Treasurer,* John O. Habich; *Secretary,* Alex Gordon; *Sergeant-At-Arms,* Emil Stepan; *Chairman, Educational Committee,* Dwight D. Orr; *Board of Directors,* R. L. Hendrickson, A. E. Karlberg, Louis Norris, Joseph Freed and Ivar Skipple.

January 23—This special meeting was held at the Hamilton Hotel and was attended by 125 men. At the opening of the meeting, Dwight Orr, Chairman of the Educational Committee, introduced H. R. Luttenbacher, district service supervisor of General Electric Co., who in turn, introduced his collaborator, Henry Kaiser of R. Cooper, Jr. Motion pictures, and slide films were presented on the servicing of several models of domestic units.

After the showing of each film, a short discussion and question period was held to permit those present an opportunity to get further details from Mr. Kaiser. While changing films, Mr. Luttenbacher offered many valuable suggestions on unit replacement and also stated that G. E. is desirious of cooperating with the independent service men who want further knowledge on their domestic units.

At the close of the educational program, a buffet dinner was served by caterers of the hotel. The food was excellent and unlimited.

TWIN CITIES CHAPTER

St. Paul, Minn., Jan. 9—The meeting was held at the Andrews Hotel, 4th & Hennepin, Minneapolis, Minn. The meeting was called to order by President McCafferty. President McCafferty cited a few incidents in the history of the Chapter. He then turned the meeting over to the new officers and President Frank introduced the visitors.

There were 45 members present. The application of Willard D. Nelson was read and accepted for changing from Associate to Active membership. The applications of Melvin F. Weichelt, Active; S. R. Grouse, Associate; and H. A. Siewert, Active were read.

Art Palen reported for the legislative committee. He read the proposed by-laws and they were accepted by the members.

C. A. McCafferty reported on the plans for the February meeting to be held as an open dinner meeting. A committee composed of Mr. McCafferty as Chairman and George Gartner, Ben Heller and Leonard Knight was appointed to make the necessary arrangements.

WOLVERINE CHAPTER

Lansing, Mich., Dec. 11—The meeting was held at The 1861 House where members enjoyed a turkey dinner and a speaker furnished by The Gilmer Belt Co., who discussed the manufacture and application of V-belt drives. The meeting was attended by a large percentage of the members, some of whom had not been out for quite a while.

Cards were distributed allowing each member a chance to win a box of refrigeration tools at the meeting of January 8.

The entertainment committee appointed at the November 27 meeting consisted of Clare McNaughton, Less Lockwood, and Sid Ferrin. Austin Boyer of Lifsey Distributing Co., arranged for the speaker.

Jan. 8—No business was transacted as President Leslie Lockwood was absent due to the serious illness of his wife. Discussion prevailed on the selection of a committee to keep posted on the welfare of the members.

A drawing was held to present a box of tools as a door prize, John Bush being the lucky man. After the drawing, a delicious luncheon was served and enjoyed by all.

MAGNOLIA CHAPTER

Jackson, Miss., Dec. 13—The meeting was held at the Pollard Appliance Co., 118 S. Lamar Street. Applications of three new members were accepted. After routine business was cared for, the following officers were elected: *President,* A. E. Shafer; *First Vice-President,* S. C. Odum; *Second Vice-President,* C. W. Bowron; *Secretary,* F. B. Frazee; *Treasurer,* J. P. Binns; *Sergeant-at-Arms,* C. K. Bowron; *Chairman of Education Committee,* L. H. Williford, Jr.

This meeting marked the passing of the first year for the Chapter. As a token to the Chapter, a cake adorned with one candle was presented to the members.

Jan. 10.—The members held a regular meeting at Shafer Refrigeration Service Co., 511 E. Pascagoula St. The meeting was called to order by Charles Bowron, Vice-President, who introduced and installed the new officers elected at the last regular meeting.

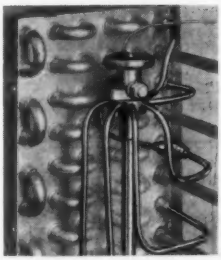
President A. E. Shafer then conducted the business meeting. After the transaction of business, J. D. Lloyd of Shelby Electric Co. presented two films from Westinghouse on maintenance entitled "Four Firsts of Motor Maintenance." These features were well received by the membership.

TOLEDO CHAPTER

Toledo, Ohio, Jan. 10—This very successful meeting was held at Redmans Hall. After electing the two members that were appointed for a special board meeting as director for the year, a report was given by Paul Sizer on the Toledo Code. The highlights of the Code were thoroughly discussed. One new member was accepted to membership.

The speaker of the evening, Paul Donke of Mueller Brass Co., gave a talk and displayed new products to look forward to after the war. The evening was concluded with a luncheon enjoyed by twenty-three members and guests.

REDUCE THAT WASTE LINE



The Multi-Outlet Thermo Valve shown above is a typical installation. Note arrangement of outlet lines.

ALCO

857 Kingsland Avenue
St. Louis, 5, Mo.

Designers and Manufacturers of Thermostatic Expansion Valves; Pressure Regulating Valves; Solenoid Valves; Float Valves.

Keep Refrigeration Systems In Shape To Do An Important Wartime Job

Here's a weapon to use in the fight against waste in refrigeration. It's the Alco Multi-Outlet Thermo Valve—a combination expansion valve and distributor that keeps all coil surface working by insuring even refrigerant distribution.

Savings begin with installation because need for oversize coils or liquid headers is eliminated.

Operating costs are cut, too, for refrigerant is fed equally to each of the evaporator circuits. This use of all coil surface reduces running time and lengthens the "off" cycle.

The Alco Multi-Outlet Thermo Valve is part of the complete line of Alco controls that has been used for many years by the U. S. Navy and Maritime Commission. Small allocations of these same valves are made each month for urgent civilian priorities. For details, see your Alco Jobber, Alco Valve Company, 857 Kingsland, St. Louis, 5, Missouri.

This diagram shows poor distribution. Only part of the coil is properly fed.

This is the same coil, fed by a Multi-Outlet Thermo Valve, doing real work.

Niagara Frontier Chapter Christmas Party

NIAGARA FRONTIER CHAPTER

Buffalo, N. Y., Jan. 12—The regular meeting and election of officers was held in Parlor B, Hotel Lafayette. The meeting was called to order by President Muller after which the Chapter business was transacted and a report of the Christmas party was given by Ralph Davis. He was given a vote of thanks for his efforts in making the party a success as the accompanying photos will testify.

The following officers were elected for the year 1945: *President,* Ralph Davis; *Vice-President,* William Goeckel; *Recording Secretary,* Mathew Wroblewski; *Corresponding Secretary,* Louis Schnake; *Treasurer,* Chester Schintzius; *Sergeant-at-Arms,* Ed Orsolits; *Board of Directors,* John Muller, Tom Jordon and Hewitt Keirn. Messrs Schintzius, Davis, and Szyszkowski were appointed a committee to plan the Installation Banquet some time in February.

R. Davis, C. Schintzius, and S. Szyszkowski at Niagara Frontier Chapter Party

MILE HIGH CHAPTER

Denver, Colo., Dec. 11—The meeting was held at the offices of Frigidaire Division, 1920 Market St. with twenty-six present consisting of a slight majority from Pueblo. After routine business had been completed, Don Wallace of Frigidaire presented two very interesting and educational films followed by a talk on the postwar prospects of refrigeration.

Guy G. Stringer was admitted as a member and three applications from the guests were tendered after the meeting. The obligation was repeated by several new members.

Those present voted in favor of holding the next meeting in Pueblo with the members there arranging for the entire meeting.

Pueblo, Colo., Jan. 15—Meeting was called to order by Vice-President, Lyndle Barley, in the auditorium of the Southern Colorado Power Building. Twenty-five members and eleven visitors were given a very interesting talk by Mr. Carter on postwar engineering. A film was then shown covering the company's plants, transmission, and activities. Many settings were of the beautiful scenery through which the transmission lines run.

Nine new members from Pueblo were accepted and given the oath of membership by H. R. McCombs. These men are Messrs. Oliver, Ohlman, Belveal, Woodward, Kyle, Morehart, Pitcock, Coyler, and Passalaqua.

After the meeting, a plentiful lunch was served consisting of turkey sandwiches, pie, coffee, and beer. Those present from Denver were pleased with the meeting.

DAYTON CHAPTER

Dayton, Ohio, Jan. 11—Meeting was held at Allied Parts with a fair attendance. The meeting was called to order by Mr. Van Riper and was immediately turned over to the new President, Mr. Wagner. A permanent entertainment committee was appointed. The meeting then was turned over to Mr. Denny, the new educational chairman, who conducted a program that proved very interesting.

Three applicants were accepted: Walter A. Grau, George Filbrun and Raymond Wagner. The members expressed their deepest sympathy to Mrs. Emerson E. Rasor, whose husband was recently killed in an aeroplane crash.

CANADIAN CAPITOL CHAPTER

Ottawa, Ontario, Jan. 29—After a short business session, H. Arthur introduced one of the guest speakers, H. Parish, who first reviewed the background of the R.S.E.S. in Canada and then continuing his talk on post war refrigeration, frosted food and the locker plant industry. In answer to an inquiry from Mr. W. Lowery, Mr. Parish explained that locker plant operation is a merchandising proposition as well as a storage. W. Podd introduced the other guest speaker for the evening, Fraser Morris, who spoke on general refrigeration problems and how to overcome them.

It was reported that 12 new members had been accepted at a special meeting of the officers and board held earlier in the month.

TRI-COUNTY CHAPTER

Elgin, Ill., Jan. 20—Twenty members and their ladies sat down to an excellent turkey dinner served at Unity Hall, 263 DuPage Ave. This gathering included the Chapter's first member discharged from the service, A. E. Wolff. The navy was further represented by Chief Petty Officer, Wm. McCarley, home on furlough after three years in the Pacific. Mrs. McCarley was also present. A six-reel comedy was then presented.

The business meeting convened and the following new officers were elected for the coming year: *President,* R. C. Marquis; *Vice-President,* O. F. Starin; *Secretary-Treasurer,* B. V. Clark; *Sergeant-at-Arms,* Ralph May; *Board of Directors,* Leon Churchill, A. E. Wolff and Fred Johansen.

Tentative arrangements were made for the initiation ceremony to be conducted at the Feb. 17 meeting to be held in Aurora.

BOSTON CHAPTER

Boston, Mass., Jan. 9—The meeting was held at the Hotel Manger. Applications were received from six members and the investigating committee reported favorable on the applications of ten who had made previous application.

Communications were received from J. G. Praetz of Liquid Carbonic offering their service manual to all members servicing Liquid Carbonic equipment. The Secretary also presented a pamphlet received from I. J. Fairchild, Chief, Division of Trade Standards on the subject, "Refrigeration Condensing Units."

The following officers were elected to conduct the affairs of the Chapter for the coming year: *President,* L. W. Pierce; *First Vice-President,* Edward C. Hoyt; *Second Vice-President,* John J. Madden; *Cor. Secretary,* James McCue; *Rec. Secretary,* Herbert Swanson; *Treasurer,* Chester Sherman; *Sergeant-at-Arms,* Tom Crosby; *Chairman Educational Committee,* Wm. Paulin.

The Chairman of the Entertainment Committee introduced Mr. Paulin who spoke on "I Can Get It For You Wholesale." Mr. Paulin gave a very interesting talk.

CLEVELAND CHAPTER

Cleveland, Ohio, Jan. 11—The first meeting of the year was held at the Carter Hotel. This was a strictly business meeting to discuss the welfare of the Chapter for the coming year. A nominating committee was appointed to select officers for 1945.

Jan. 25—This meeting was opened and turned over to the Educational Committee. The interesting movies were shown and then a very helpful talk was given by Mr. Lowe of Niagara Blower Co. on the construction and servicing of evaporative condensers and their no-frost low temperature blower units.

After the educational features, the following officers were elected: *President,* Paul Sprig; *First Vice-President,* J. A. Brown; *Second Vice-President,* J. Hassman; *Secretary,* Ned Ramsey; *Treasurer,* W. E. Wright; *Sergeant-at-Arms,* G. B. Heller; *Chairman Educational Committee,* O. B. Herrick; *Directors,* Roy McCloskey, Geo. Schuld, Lawrence Gardella, W. W. Farr, Emil Flanik. The new officers will be installed February 8.

COLUMBUS CHAPTER

Columbus, Ohio, Jan. 15—Despite a terrific blizzard more than 70 guests and members attended the annual stag party. Following a short business meeting, there was an elaborate program of fine entertainment which included the awarding of 15 door prizes, a floor show and plenty of food.

WICHITA CHAPTER

Wichita, Kans., Jan. 12—Fifteen members of the Wichita Chapter attended the annual dinner at Rugh's Lunch. A regular monthly business meeting was held and the following officers were elected and installed: *President,* Harleigh Knox; *Vice-President,* Henry Hay; *Secretary-Treasurer,* Woodrow White; *Sergeant-at-Arms,* Henry Till.

ONTARIO MAPLE LEAF CHAPTER

Toronto, Ont., Jan. 19—Meeting in the King Edwards Hotel, the Chapter first conducted its business consisting of accepting three new members, appointing C. Recciоppa and T. Whelan to work on suggestions for the National Society's Service Improvements Advisory Committee, and hearing Bert Nye's report on plans for the annual banquet scheduled for February 16. President Sneath then highlighted the activities for the forthcoming Interprovincial conference to be held March 18 and 19. A delegate was chosen to represent the Chapter at the conference.

Gordon Condie, Chairman of the Educational Committee introduced Harry Anderson of Wagner Electric Co., who presented a most interesting talk on electric motors. He included the present problems of the industry and possible future trends. He also discussed their latest development, the variable speed A. C. motor and concluded by opining the ideal would be accomplished if all manufacturers would standardize on N.E.M.A. specifications to facilitate servicing, repairing, and replacements.

CORN BELT CHAPTER

Bloomington, Ill., Jan. 18—The meeting was preceded by a dinner at Lucca's Grill. President John Hamilton then opened the meeting and after some discussion the resignation of Secretary, R. E. Saunders was accepted. Mr. Saunders felt that his duties as Secretary of the Illinois State Association would be all he could assume in view of the work envolved. Carl Marcus was subsequently elected as Chapter Secretary.

This meeting was attended by Archie Fait, State Association President, who outlined some of the details to be considered in planning for the fall conference to be held in Bloomington.

Officers elected were: *President,* John E. Hamilton; *Vice-President,* Joe O. Woodard; *Secretary,* Carl Marcus; *Treasurer,* Ralph Porter; *Sergeant-at-Arms,* Albert J. Hauser; *Board of Directors,* Charles M. Trigg, Edward E. Kilmartin, Harold Mason, Raymond Patterson, and Gordon Eubanks; *Chairman of Educational Committee,* M. V. Stagg.

In addition to Mr. Fait, Glen Dresback of Illinois Valley Chapter and George Moore, a new applicant, were present.

KANSAS CITY CHAPTER

Kansas City, Mo., Jan. 3—At this meeting, the following officers were elected: *President,* Merle L. Ferguson; *First Vice-President,* W. F. Schreiber; *Second Vice-President,* George Rostock; *Secretary,* Cecil R. Visger; *Treasurer,* Floyd Haller. Applications of four new members were accepted. Discussion followed on a suitable meeting place and Mr. Shapiro offered the second floor of his building.

SAN DIEGO CHAPTER

San Diego, Calif., Jan. 25—The meeting was held in the meeting room of the Anderson Building. A steak dinner was prepared and served by the entertainment committee. The business meeting was opened by retiring President, Freidrichs, with 26 members and eight guests present. Mr. Freidrichs then turned the meeting over to President R. L. French who appointed committees for the coming year and mentioned plans made for some interesting meetings to follow.

Applications from two prospective members were read and turned over to the membership committee for action. Several guests were introduced, among them Willis Stafford, now in the U. S. Navy, who gave a short talk on meetings he had attended of other Chapters in the East and Middle West section.

ILLINOIS VALLEY CHAPTER

Peoria, Ill., Dec. 8—At this meeting, the following officers were elected for the ensuing year: *President,* H. P. Loercher; *Vice-President,* Harry Hauser; *Secretary,* Wayne Eakle; *Treasurer,* Clyde Tobias; *Sergeant-at-Arms,* Oscar Carlson.

Jan. 12—Meeting was held at the Jefferson Hotel for the purpose of installing officers. President Loercher appointed several committees and outlined the duties and functions of the officers. An open discussion followed on plans for educational features at the coming meetings.

CENTRAL NEW YORK CHAPTER

Jackson, Miss., Dec. 13—The meeting was called to order by President, Arthur Snyder, for the purpose of electing officers. Officers elected were as follows: *President,* Arthur Snyder, incumbent; *Vice-President,* Robert H. Wilson; *Secretary,* Ray D. Hursh, incumbent. After the election of officers, Nelson Swift, Chairman of the entertainment committee was instructed to proceed with the arrangements for the annual banquet.

Ladies Auxiliary

ILLINOIS VALLEY AUXILIARY

Peoria, Ill., Jan. 12—Meeting was held in the Jefferson Hotel with a good attendance for election of officers. Officers elected were as follows: *President,* Mrs. Archie Fait; *Vice-President,* Mrs. H. P. Loercher; *Secretary,* Mrs. G. W. Dresback; *Treasurer,* Mrs. A. D. McGill; *Sergeant-at-Arms,* Mrs. Clyde Tobias.

Activities for the year's meetings will continue with the "Secret Pal Program," door prizes and special prizes for winners of games played during the social period of the meetings. The members voted to donate $5.00 to the Peoria Red Cross.

THAT 6X!!!X WATER REGULATOR. COMPRESSOR STOPPED TEN MINUTES AGO AND WATER STILL RUNS
IF I ADJUST CUT-OFF, SO WATER WONT RUN SO LONG AFTER COMPRESSOR STOPS, THEN THE MOTOR GETS HOT BECAUSE OF THE HIGH PRESSURE LOAD
YOU NEED A "FLOCHECK" THEN WATER REGULATOR WILL INSTANTLY START AND STOP WITH THE COMPRESSOR
REFRIGERATION SUPPLIES
WATER BILLS ARE REDUCED THE MOTOR STAYS COOL!
AND IT'S GOOD BYE TO VALVE STICKING TROUBLE AND SEAT WEAR
SNAP SNAP
FLOCHECK
FITS ANY MAKE AND SIZE OF WATER REGULATOR
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√ General Controls K-15, two-wire, current failure, high pressure valve handles large capacities with minimum pressure drop. Main valve held open electrically minimizes pressure loss.

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BRANCHES: Atlanta, Boston, Philadelphia, San Francisco, Denver, Chicago, Kansas City, New York, Cleveland, Detroit, Dallas

TWIN CITIES AUXILIARY

Minneapolis, Minn., Jan. 9—An attendance of eleven members and one guest were present for the annual election of the following officers: *President,* Mrs. Klahn; *Vice-President,* Mrs. Ost; *Secretary,* Mrs. Holmes; *Treasurer,* Mrs. Grow; *Sergeant-at-Arms,* Mrs. Berheim. Mrs. Klahn expressed her appreciation of the efforts of the past officers for their splendid work and promised a successful year. Parties for the ensuing year were discussed and definite arrangements are being made.

Minneapolis, Minn., Dec. 5—The meeting was held at the home of Mrs. Dean Holmes and was attended by ten members. Plans were completed for the Christmas dinner to be held at the Elks Club. The chapter By-laws were amended to permit election of officers in December instead of January, election of officers for 1945 to be held at the January meeting. Special activities for the next few months will also be arranged.

KANSAS CITY AUXILIARY

Kansas City, Mo., Jan. 20—The Kansas City Auxiliary gave its sixth annual Christmas party on December 19 at Bono's in the Inter-City district with husbands as guests. Reservations were made for forty. Music was furnished for the evening with dancing before and after dinner. Sixteen students from the Stover Lane Studio of Dancing entertained with novelty dance numbers. The show was arranged by Mrs. House of Stover Lane. The consensus of opinion seemed to be that this was one of the best parties sponsored by the Chapter. Mrs. Mendenhall and her committee deserve a great deal of praise for their successful arrangement of the affair.

Jan. 3—Meeting was held in the offices of Temperature Engineering Corp. After the annual report of the Secretary and Treasurer, new officers were installed.

ROCKFORD AUXILIARY

Rockford, Ill., Nov. 20—Two new members were accepted: Mrs. D. E. Sibert and Mrs. Russell Robertson. Names were drawn for the "Mystery Lady" for the year 1945 and the names of the "Mystery Lady" for 1944 were revealed; also names of the members were drawn for Christmas gifts.

Dec. 19—A Christmas party was held at the Faust Hotel, and a buffet lunch was served, after which gifts were exchanged. The drawing was held for a quilt on which the ladies had previously sold chances.

TRI-STATE AUXILIARY

Huntington, W. Va., Dec. 17—The annual Christmas dinner and party was held at the home of Mr. and Mrs. C. A. Brunton. A delicious turkey dinner with all the trimmings was served at 6:30 to members and their families. During the social hour, Christmas carols were sung.

Jan. 9—The meeting was held at the home of Mr. and Mrs. A. W. Gruber. A delicious pot luck dinner was served at 7 o'clock to members of the Tri-State RSES and Ladies Auxiliary. Mrs. Albertson, the President, conducted the business meeting. Two new members, Mrs. Geo. Douthat and Mrs. Geo. Haldane, were welcomed into the auxiliary, after which a social hour was enjoyed.

NIAGARA FRONTIER AUXILIARY

Buffalo, N. Y., Jan. 12—The meeting was held at the home of Mrs. A. H. Keirn with an attendance of eight members. Officers were elected as follows: *President,* Mrs. Edward Orsolits; *Vice-President,* Mrs. Walter Bobzien; *Secretary-Treasurer,* Mrs. William Goeckel; *Sergeant-at-Arms,* Mrs. A. H. Keirn.

MRS. L. E. LOCKWOOD, DECEASED

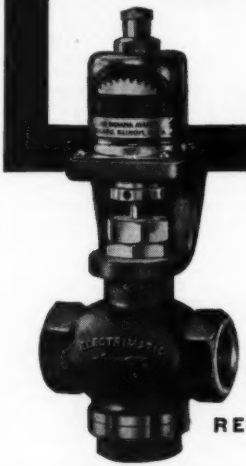
Mrs. L. E. Lockwood, wife of the President of Wolverine Chapter at Lansing, Mich., passed away and was buried Friday, Jan. 26.

JOBBER MODERNIZES STORE

FEELING the need of supplying the service man with his requirements in a prompt and efficient manner, the N. O. Nelson Co., 3158 Boyle Ave., St. Louis 10, Mo., has completely modernized its counter sales and mail order department. (See Front Cover). The city counter is arranged to display many items in glass show cases with bins underneath for fast moving parts. Directly behind the counter are bins arranged to permit customers to see the items they want while standing in front of the display counter.

J. H. Spence, manager of the Refrigeration Supplies Dept. has taken an interest in elevating the refrigeration and air conditioning wholesale supply business up to the level at which a business of this type can and should be operated. As former service manager for the Hussman-Ligonier Company, and prior to that, service and wholesale sales manager for Arthur H. Lindberg Co., Mr. Spence says: "During the fifteen years I have been in refrigeration, I have always felt that the refrigeration jobbing and servicing business should be placed on a business plane to which these services are justly entitled. I sincerely believe that, in remodeling the refrigeration and air conditioning supplies department, I have been successful in carrying out many of the thoughts and desires that I have had for a number of years."

EFFICIENT... ECONOMICAL



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Individually tested for efficient, economical operation. WP regulating valves may be mounted in any position and will give lasting, trouble-free performance. Brass body, two ply power bellows and corrosion resistant materials for all internal parts. They are designed not only to start and stop the flow of water but also to feed the economic amount of cooling water to secure the proper condensing pressure without waste. The water flow increases and decreases with the rise and fall of actuating pressure.

WP regulating valves are available in ⅜", ½" and ¾" FPT sizes and other valves of other types are available in sizes ranging from ⅜" to 2" FPT.

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Simplified MOTOR-CAPACITOR *Servicing*

● **It's very simple—and profitable—the Aerovox way. Just 28 universal numbers—22 for 110-volt, 6 for 220-volt—take care of 90% or better of all motor-starting capacitor replacements. Handy Aerovox conversion chart indicates correct universal type for previously available type.**

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New Equipment .. Processes Appliances .. Methods

Information under this heading is furnished by manufacturers of the articles listed and is not the opinion of the Editor.

New Logan Quick Change Gear Cabinet Lathe

COMBINING all the features of the standard Logan Quick Change Gear Lathe in a compact cabinet, the new Logan No. 825 Lathe is adaptable to tool room work, for maintenance, for training, or for production. The entire unit is ruggedly built to stand the rigors of continuous use.

The carriage with friction feed automatic apron travels over a bed that is ground to within .0005 in. of absolute accuracy. Total run-out of its headstock spindle 12 inches from the bearings is less than .001 in. The lead screw is held to within .002 in. in 12 inches. The spindle turns on a double row of preloaded precision ball bearings, and at 40 other vital points friction is minimized by self-lubricating bronze bearings.

All moving parts and gears are completely enclosed. The power plant and underneath drive are enclosed in the left compartment of the four-drawer, stipple finish gray steel cabinet. A Multiple V-Belt Drive transmits power from cone pulley to spindle. Adjustments of both flat and V-Belt tensions are easily accessible to the operator. The unique three-point base assures a steady installation on any floor.

Full information and complete specifications on this new Logan Quick Change Gear Cabinet Lathe may be obtained on request from Logan Engineering Co., 4901 W. Lawrence Avenue, Chicago 30, Illinois.

S S S

New Tachometer

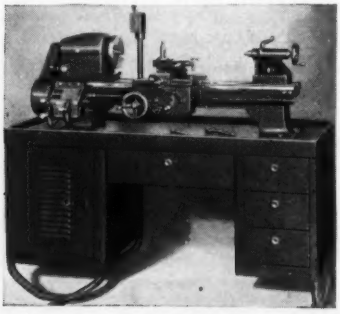
ACCORDING to Standard Machinery Co., the manufacturer, an altogether new form of tachometer is now available. It weighs but 5½ ounces, is 2¼ inches in diameter, and permits of one hand operation. The recording in RPM is readily read without the use of other counting or timing devices.

Readings are constant and record fluctuations which are not easily read on current types of equipment. Range of the instrument is from 500 to 3,000 RPM and the manufacturer advises that standard units have already been subjected to 50,000 test readings without any variation in accuracy.

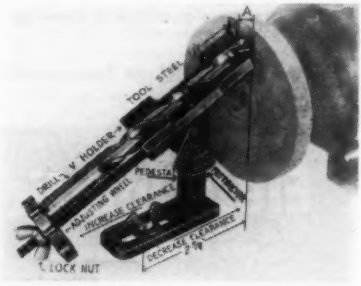
Drill Grinding Jig

WORKING with the aircraft tool engineers, Fred F. Ten Eyck and his production experts evolved the E-Z Drill Grinder which is not only a simple jig but is practically foolproof and can be set up quickly on a grinder frame or on a bench adjacent to the grinding wheel. The E-Z Drill Grinder is simplified to the point where only a few standard motions will produce a factory finish on a dull drill in less than half a minute, even when done by an inexperienced girl. This new drill grinder has a protractor feature which enables it to be set quickly for three different drill point angles, depending upon the hardness of the material upon which the twist drill is to be used.

The E-Z is extremely rugged and, because of its simplicity, is produced in large quantities at a fraction of the cost of the older and heavier, stationary types of twist drill sharpeners. The E-Z Drill Grinders have been installed in aircraft factories, in garages, in repair shops, both in cities and farms, and it is used extensively by hobbyists. It sharpens all round shank drills from the shortest to 11" long—$\frac{3}{32}$" to $1\frac{1}{16}$" diameter. The manufacturer guarantees it to do the work or money back. The new E-Z Drill Grinder with its protractor feature gives a cutting edge that produces faster drilling, perfect hole centers and clearance. Model 2, just put on the market, sells for $2.80 complete with protractor. Other models, for use in sharpening drills requiring heavier or lighter types of material are being produced.



Logan Gear Cabinet Lathe.



Model 2 E-Z Holder.

Injurious FUMES!

● Whether refrigeration gases are fatal or merely irritating, maximum protection is a safety requirement. The first step is to disperse fumes if possible. Then . . .

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CESCO's No. 605 Fume Kit offers *triple protection* to refrigeration servicemen. Quick-change filter cartridges provide safety against ammonia fumes, methyl-chloride and sulphur-dioxide . . . *all in one convenient kit.* The soft molded rubber face-piece of the fume mask, and the instantly adjustable headgear, assure a gas-tight, comfortable fit for every wearer. Large safety glass lenses give perfect visibility.

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FOR SAFETY

YES, the refrigeration service business is great today. Everything looks rosy. Plenty of work—nice profits, too. But suppose you come down out of the clouds and consider the future. Look ahead to the time when there may be more men than jobs—and when service work will go to the men best qualified to handle it—not just any "handy man." Think that over and you'll understand why

U. E. I. BALANCED TRAINING

(home-study instruction *balanced* with actual shop practice) in refrigeration and air conditioning is increasingly popular, not only with future-minded men young in refrigeration, but with smart "old timers." They are "sitting pretty" today, too, but they have their eyes on the future opportunities and want to be ready for them.

Their choice is U.E.I. because they know it is a school with more than 17 years of experience in training men for refrigeration and air conditioning. They know there is nothing experimental—nothing unproved—nothing new-fangled or untested about Balanced Training. It works.

First step toward making certain you'll be sitting pretty in the future is to mail this coupon—NOW.

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HIGGINS INDUSTRIES ANNOUNCE NEW APPLIANCE DIVISION

THE establishment of an Appliance Division for distribution of nationally known commercial and domestic products in the New Orleans territory has been announced by Higgins Industries, Inc., builders of Wartime landing craft. J. O. Crary, manager of the new division, said dealership inquiries are invited from Louisiana, Southern and Central Mississippi, Southern Alabama and Western Florida. Some franchises already have been accepted, he said. Headquarters and display rooms for the Appliance Division will be at 521 City Park Avenue, New Orleans, in a modern air conditioned building. Mr. Crary is one of a number of executives in the Higgins organization whose prewar record includes extensive sales and distributing experience.

For 15 years in the appliance field with Frigidaire Division of General Motors and other national corporations, Mr. Crary was progressively salesman, dealer, supervising engineer and branch executive. For several years prior to joining Higgins Industries, Inc., he was manager of the commercial and air conditioning department in the Frigidaire New Orleans Branch.

L. V. Busenlener, former Frigidaire sales engineer and more recently head of the commercial and air conditioning department of Higgins Industries, Inc., will be manager of the commercial and air conditioning department of the new Appliance Division.

This complete line of commercial appliances will include the latest type of Carrier room coolers and all types of air conditioning equipment, a full line of heating equipment which will include central heating systems, unit heaters, floor furnaces both gas and oil fired, Carrier home and farm freezers, commercial refrigeration units, including display cases, reach-in refrigerators, beverage coolers, milk coolers and water coolers, ventilation equipment of all types for industrial and home application, attic and wall insulation for homes and industrial plants.

In addition complete locker storage systems will be offered which will supply all equipment necessary for the quick freezing and storage at below zero temperatures for sea foods, meats, vegetables, and other perishable products.

The Appliance Division of Higgins will offer specialized training and promotion service for dealers, salesmen and service men. We are fortunate to have in our organization men with years of experience in these fields and their talents will be put to use in the Appliance Division.

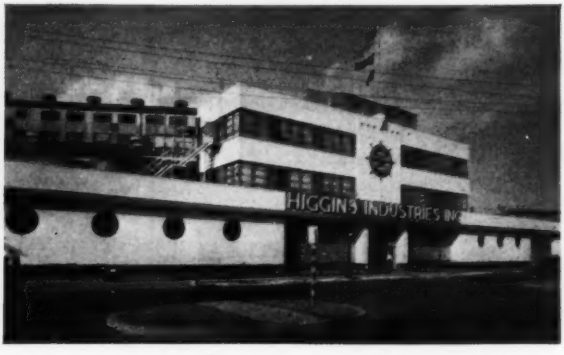
* * *

POWER HISTORY BOOKLET

AN interesting and entertaining 52-page booklet has been issued by the Multiple V-Belt Drive Association, Chicago, Ill. The booklet gives a thumbnail history of man's efforts to transmit power for his own benefit. It begins with earliest known mechanical devices, such as use of logs, lever and inclined plane in building the Pyramids, and traces step by step improved devices that have been devised and put to work through the ages, many of which have been drawn on in devising and perfecting the modern V-belt drive. The booklet is illustrated with pictures and drawings throughout and these, with the text, serve to present interesting and informative data on the development of power transmission.

HOME OF HIGGINS APPLIANCE DIVISION

This air conditioned building at 521 City Park Avenue, New Orleans, will be the most modern distribution headquarters in the South when it is occupied by the Appliance Div. of Higgins Industries, Inc. Complete display rooms will be set up. The building has been the office for the Higgins City Park plant in rear, which has manufactured thousands of landing craft and motor torpedo boats.



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is a finely-treated colored refrigerant oil which penetrates every nook and cranny of the system. The leak is indicated by a red stain – just like the discoloration on a carburetor in which ethyl gasoline has been used. Can be used *safely* and *effectively* with any type of refrigerant.

See your jobber today. If he has not stocked Visoleak write for complete information.

WHOLESALE PRICES		CASE LOTS
4 ounce bottle	$ 1.00	48 bottles
8 ounce bottle	1.75	24 bottles
1 pint bottle	3.00	24 bottles
1 quart bottle	5.00	12 bottles
1 gallon can	16.00	6 cans

SAVE 10% ON CASE LOTS

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TIME TELLS THE STORY...
Users everywhere praise the performance of Sanitary Quicfrez. And remember, thousands of Sanitary freezers were in use before Pearl Harbor.
WRITE FOR LITERATURE.
SANITARY REFRIGERATOR COMPANY
FOND DU LAC, WISCONSIN
SANITARY Quicfrez

GENERAL CONTROLS APPOINTS WILSON BRANCH MANAGER

THE appointment of Joseph W. Wilson has been announced by General Controls Co., Glendale, Calif. as Manager of the Glendale Branch Office. Mr. Wilson has an excellent background in the industrial and domestic heating field. After graduating from Holland's Domestic Heating Engineering and Combustion Engineering School, he served as heating engineer for the Holland Furnace Company for 15 years and as manager of several Holland branches. He was also, for a time, sales engineer and later production manager of the Kinney Aluminum Company. As manager of General Controls' local Branch, he will devote his entire time to serving users of automatic controls in the heating, refrigeration, aircraft and industrial fields throughout the Southern California, Arizona and Southern New Mexico area.

J. W. WILSON

STANDARD BRASS HOLDS REFRIGERATION CLINIC

A REFRIGERATION clinic was held January 20 by the Standard Brass & Manufacturing Co., Beaumont, Tex. Approximately 100 refrigeration distributors, dealers and service men attended.

The clinic opened at 10:00 a.m. with a display of manufacturers' equipment and products. Immediately after luncheon, manufacturers' representatives gave a five minute talk on what can be expected in the way of equipment today and for the postwar trade.

D. D. Langdale gave an interpretation of WPB orders affecting the refrigeration industry. The meeting was then thrown open to discussion and questions were solicited and answered by the speakers.

PHILCO CORP. plans to produce household freezer chests for processing and preserving frozen foods, as soon as war conditions permit, John Ballantyne, president, announced in a letter to stockholders. He estimated that some 750,000 families will want freezer chests within two years after the war.

SCHROEDER TRANSFERRED TO SERVEL AC DIVISION

IT HAS been announced that Carl Schroeder has joined the Air Conditioning Division of Servel Inc., Evansville, Ind. Previously Mr. Schroeder was associated in the Research Division of Servel's engineering department. Before going with Servel he was refrigerating engineer with the Sunbeam Electric Manufacturing Company of Evansville. Mr. Schroeder is a graduate of the University of Chicago.

CARL SCHROEDER

HONEYWELL ANNOUNCES NEW SOUTHWESTERN SALES ZONE

FORMATION of a new sales zone, with headquarters in Houston, Texas, has been announced by the Minneapolis-Honeywell Regular Company. The zone will encompass the territory in the Southwest formerly under jurisdiction of the Atlanta zone and will maintain offices in Houston, Dallas, Tulsa and New Orleans.

Minneapolis-Honeywell now maintains offices in 47 cities in the United States and plants in Minneapolis, Chicago, Wabash and Philadelphia. A Canadian subsidiary operates a plant in Toronto and sales and service offices in several Canadian cities. Robert Mallory, formerly branch manager of the Houston office, has been named as manager for the new Southwestern Zone.

CARE OF MICROMETERS

A BOOKLET has been announced by Save-Way Industries, Detroit, Mich., describing the functions of various parts and tells which to use in taking care of micrometers. Illustrated and written in simple language, the booklet stresses the importance of frequent checking to insure accurate readings. This booklet is of interest to mechanics, toolmakers, machinists, engineers or students doing precision work.

ANOTHER *"First"* FOR KRAMER!

1st in Service . . . 1st in Values

NOW FIRST WITH THE NEWEST, MOST UP-TO-DATE CATALOG

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• **OUR NEW PHONE** •
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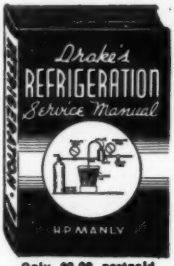
Member of The National Refrigeration Supply Jobbers Association

You'll find the answer
IN THIS *NEW* REFRIGERATION BOOK



Only $2.00 postpaid. 300 pages. 138 illustrations.

1. This new 1945 Refrigeration Service Manual contains complete information on all recent developments in household and small commercial refrigeration. Written by an authority in the field . . . covers every angle . . . installation, testing, trouble shooting, repair, replacements as well as refrigeration for air conditioning systems. **Even includes gas refrigeration.**

300 pages of valuable data and 138 diagrams, charts and illustrations make this volume a ready source of vital information for the beginner or experienced professional man in refrigeration..**$2.00**

OTHER *"MONEY MAKING"* BOOKS

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5. THE SLIDE RULE AND LOGARITHMIC TABLES: 200 pages, illustrated. Explains use of slide rule and short cut log tables. Even includes 10 place log tables **$1.50**

6. MATHEMATICS FOR READY REFERENCE: 324 pages and plenty of illustrations explains short cuts and various math problems. Excellent reference book **$2.00**

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Address .....

City..... Zone..... State.....

UNITED STATES ELECTRIC CO. HAS NEW MANAGER

RICHARD M. POTTER has recently been appointed General Manager of the United States Electric Company refrigeration jobber of Springfield, Ill. Mr. Potter has been territory representative since the early part of 1941 when he joined the company. Through his contacts with the service men he has aided them in the proper selection of equipment as well as kept them currently familiar with the various government orders affecting the purchase of materials.

Better known as Dick Potter, he has a wide acquaintance in Central Illinois and expects to continue to maintain field contacts throughout the area served by the company.

S S S

AEROVOX CORP. SOLD

A GROUP headed by W. Myron Owen, formerly vice-president of Detroit Harvester Co., and including H. Bruce Kinsman Associates of New York, has purchased the Aerovox Corp. of New Bedford. The Aerovox Corp., organized in Brooklyn 21 years ago, is a manufacturer of electric condensers for the radio, television, fluorescent lighting, electrolytic, transformer, refrigerator and automotive fields. Mr. Owen is president of Aerovox.

S S S

THEIS ADVANCED BY PHILCO

EDWARD F. THEIS, who until 1942 was closely associated with the Company's Refrigerator Division, has just been elected vice-president in charge of Refrigerator Production for Philco Corporation.

In 1937 Mr. Theis was Works Manager for the Fairbanks-Morse Company's Indianapolis home appliance division plant. The following year, when Philco entered the refrigeration industry and acquired the Fairbanks-Morse refrigerator rights, Mr. Theis became Works Manager of the Refrigerator Division of Philco Corporation.

S S S

Ralph Decker

Ft. Riley, Kans.

The best little magazine ever to have its pages rumpled by a service man's soiled thumb.

SERVICING THE COLDSPOT

(Continued from page 29)

hammer and drive straight down or pry up on as many corners as necessary.

Rigid Connected Motors

On all units manufactured since 1933, the motor and compressor are rigidly connected in permanent alignment (Fig. 21). All such rigidly connected motors are of the capacitor type but of various trade-names. Emerson, Delco, and General Electric motors have been used. They are all interchangeable as to mounting and wiring and the characteristics are so similar that no difference in their operation will be discussed.

The rigid connected motor can be removed from the unit in the field for service or replacement. The four cap screws which hold the special motor flange to the compressor housing can be removed. The large nuts on the motor supports can be removed with an end wrench while holding the cushion spring plug by inserting the blade of a screwdriver firmly in the hole. The fan set screw can be loosened and the fan slipped off the shaft and left in the condenser housing. After disconnecting the wiring at the motor terminal board, the entire motor is shifted toward the condenser until the coupling and flange will clear and can be lifted off of the unit. To replace the motor reverse the foregoing operations.

Alignment of Motor and Compressor

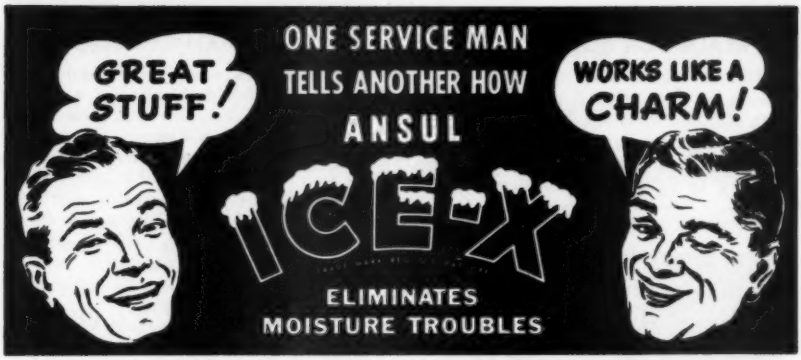
In spite of the fact that the rigid connection between the motor and compressor is designed to insure correct alignment, it is possible to assemble them incorrectly and cause a slight but troublesome lack of alignment. If the coupling washer is worn badly or if the motor has a tendency for excessive vibration, the cause may be in the assembly as mentioned.

To correct this small misalignment, the four cap screws in the assembly flange can be loosened and then *opposite* screws tightened a little at a time so that the entire flange is pressed into its final position *parallel* to the compressor face.

(To be continued in next issue)

S S S

Paul B. Waggoner is conducting business under the firm name of Waggoner Refrigeration service at 6007 West Pico boulevard, Los Angeles, Calif.



ICE-X quickly cures emergency freeze ups when ice forms at the expansion valve or capillary tube. Harmless to use. Great for Freon, Carrene, or Methyl Chloride systems . . . The dependable liquid anti-freeze.

ORDER FROM YOUR JOBBER OR—

THE HARRY ALTER CO. 1728 S. MICHIGAN AVE. CHICAGO 16, ILLINOIS

JOBBERS: WRITE FOR SPECIAL PROPOSITION!

NOW! DAY AND NIGHT WATER COOLERS FOR WAR PLANTS AND INDUSTRIAL CAFETERIAS

Now they can be sold! Day and Night glass filler coolers for industrial cafeterias; bubbler coolers for war plants.

WRITE FOR LATEST DATA

DAY AND NIGHT **COOLER DIVISION**
DAY & NIGHT MFG. CO.
MONROVIA • CALIFORNIA
FACTORY REPRESENTATIVES
NEW YORK — A. C. Homeyer, 682 Bdwy. • CHICAGO — Marc Shantz, 565 Wash. Blvd.
ST. LOUIS — R. H. Spangler, 1331 Market St. • ATLANTA, GA. — J. E. Parker, 251 Peachtree, N. E.

1945 AIRO CATALOG READY FOR DISTRIBUTION

THE new 1945 catalog now ready for release by Airo Supply Company, 2732 North Ashland Avenue, Chicago 14, Ill., to refrigeration dealers and contractors is to meet the expectations of refrigeration men, according to L. C. Keely, manager of the company.

L. C. Keely, Manager of AIRO Supply Company, Chicago, inspects copy of the new 1945 catalog now available to refrigeration dealers and contractors.

This conclusion is based on the comments heard from men who have seen copies of Catalog No. 45, which incorporates many important features that promise to make buying easier for busy servicemen, dealers, and contractors. The major portion of the items catalogued is ready for shipment to customers the same day the order is received. The arrangement of the catalog is completely new, special attention having been given to logical grouping of similar or related merchandise. All prices are the dealer's actual cost figures, and special discounted prices allowed for quantity buying are listed also. Not only have new lines been added, but old familiar ones have been augmented where possible. Likewise, where curtailment of manufacture has eliminated certain items or even complete lines, acceptable substitutes are listed.

Because of wartime restrictions on the use of paper, it has been possible to print only a limited number of this catalog, and for that reason it is suggested that dealers and contractors place their requests for a copy without any delay.

KELVINATOR ANNOUNCES NEW CANADIAN OFFICERS

C. W. HADDEN was elected president of Kelvinator of Canada Limited at a meeting of the board of directors held at Montreal. Mr. Hadden had been a vice-president of the company for nine years and its general manager.

Announcement was also made that J. S. Blay was appointed vice-president in charge of sales, and A. V. Phillips vice-president in charge of engineering. Mr. Blay was for several years general sales manager, and Mr. Phillips was chief engineer.

R. L. C. Keith, secretary and comptroller, was appointed secretary and treasurer.

G. E. ACQUIRES NEW PLANT SITE

THE General Electric Co. has exercised options on a new plant site in Ashtabula, Ohio. The site of approximately 100 acres of land is to be used in G.E.'s postwar plan for constructing a new refrigeration unit manufacturing plant. The company has announced that the plant will probably cost between four and five million dollars.

REFRIGERATOR OF THE FUTURE

(Continued from page 35)

that the individual with an ordinary refrigerator would be entirely handicapped as frozen meat can be put in the defrosting pan for a week, and slow defrosting is sometimes better.

In regard to postwar expectations, he felt that we would like to have a real deluxe two-in-one refrigerator but we must reach the low income market including some 8,000,000 homes now without refrigerators. The home freezer is a real economy and he estimated the potential business as approximately ten percent of the domestic refrigerator business. It will be highly competitive and many manufacturers will enter the field, he said.

The speaker emphasized the importance of the service problems that will be encountered, such as sweating and insulation, all more difficult than those encountered in domestic boxes. He expressed the hope that the industry would not get a black eye from lack of attention to these important factors. We should have, he said, high standards of ratings and tests, and to sell them is going to be a real job and not a pushover.

A DREAM COME TRUE!

Here it is—the kind of a refrigeration tools, parts, and equipment catalog you've always wanted. Put out by AIRO, of course. Write for yours today sure!

Dept. A

AIRO SUPPLY CO. (NOT INC.)
WHOLESALE ONLY
2732 N. Ashland Avenue
Chicago 14, Illinois

MAYFLOWER

UNITS AND PARTS

COMPLETE stocks of genuine Mayflower Condensing Units and Parts. Service men, consult your jobbers, or write us direct. Jobbers, we solicit your inquiries.

MAYFLOWER
PRODUCTS, Inc.
13 S. 5th St.
Richmond, Ind.

GASKETS—SPEED VICTORY

Write for complete catalog.

• Until Victory is won, war orders come first. Today, our gasket service for every refrigeration need is helping speed war production. Under these conditions, delays in filling other orders are unavoidable.

CHICAGO-WILCOX MFG. CO.
7701 Avalon Ave. Chicago 19, Illinois

Did you say— No Refrigeration on a Meter-Miser

Are you prepared to give prompt and efficient service when the original refrigerant has leaked out?

Don't pass up these calls because you haven't the original refrigerant—get

HERVEEN

the Ideal Replacement Gas

More and more service men are finding this gas measures up to their expectation for performance in Meter-Misers. Customer satisfaction has also been proven when HERVEEN replaces the original charge.

Who'll take this call?

HERVEEN is now stocked by most jobbers. If you are unable to obtain it through your jobber, write direct to

MODERN GAS CO., Inc.
MANUFACTURERS & REFINERS
1084 Bedford Ave.
Brooklyn 5, New York

UNIVERSAL COOLER PLANNERS LOOK TO POSTWAR

WAR production and postwar potential of Universal Cooler Corporation were outlined at the annual executive conference held at Hotel Harding, in Marion, Ohio. Problems attendant upon reconversion and production for peace, as well as new advertising, sales and servicing plans, came up for thorough discussion at the 2 day meeting.

Among those in attendance were all of Universal Cooler's field engineers in this country, and General Manager Dan Robertson and Sales Manager Harry Parrish, of Universal Cooler of Canada, Ltd.

Vice President Tom Pendergast presided, and talked on priorities and their relation to reconversion. He also outlined the added requirements of the Armed Forces for refrigeration. President F. S. McNeal discussed post-war plans in general. Chief Application Engineer E. G. Haight and W. W. Higham, vice president in charge of engineering, discussed product development and the new Applications Department. Advertising Manager J. L. Danner outlined postwar advertising and Service Manager A. J. Mattes discussed servicing and the authorized jobber organization, while today's purchasing problems were reviewed by Purchasing Agent R. J. Alcorn.

Seated (left to right): President F. S. McNeal, Vice-president W. W. Higham, Vice-president T. S. Pendergast; Sales Manager Harry Parrish and General Manager Dan Robertson, of Universal Cooler of Canada; and Purchasing Agent R. J. Alcorn. Standing (center, left to right): John Hutchison (Canada), Floyd Lowell, Service Manager A. J. Mattes, K. C. Goodrich, A. E. Cadwell, H. L. Gray (Canada) and Advertising Manager Jack Danner. Back row (left to right): J. C. Duer, J. L. Zant, B. W. Wiant, Sam White, Perry Hall, Phil Hedrick, Chief Application Engineer E. G. Haight and Johnson P. Scott.

SUPERIOR VALVE & FITTINGS CO. OPENS CHICAGO BRANCH

ANNOUNCEMENT is made by K. M. Newcum, vice president in charge of sales, Superior Valve & Fittings Company, Pittsburgh, Pa., that an office and warehouse will be opened on February 15 at 565 West Washington Blvd., Chicago 6, Ill. This office and warehouse will be the stocking and shipping point for catalogued items such as valves, fittings, manifolds, and accessories.

IRVING A. WILSON

THOS. CUNNINGHAM

Irving A. Wilson, Superior's present midwestern representative has been appointed district manager and will continue to maintain field contacts for the area comprising Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, Colorado, Indiana, Western Michigan, and the western tip of Kentucky.

Thomas E. Cunningham, who has been transferred from the factory will be assistant manager and have charge of the office and warehouse.

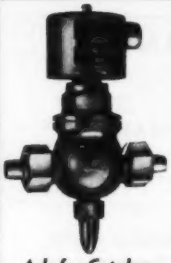
"The prime purpose of establishing this office and stocking a warehouse in Chicago is to give better service on standard items of our manufacture," stated Mr. Newcum. "Orders for items of a special nature or items requiring source inspection by the government will in most cases be forwarded to and shipped direct from the factory at Pittsburgh. Acknowledgment copies of our shipping orders will indicate point from which shipment is made."

S S S

ARTHUR RADTKE is the president of the Cincinnati Refrigeration & Air Conditioning Association for 1945. Other officers are John Rash, vice president and L. J. Quinn, treasurer. August Bachman was renamed executive secretary.

THE HARRY ALTER CO.

1728 S. Michigan Ave. Chicago, Ill. — Two Big Warehouses to Serve You — 134 Lafayette St. New York, N. Y.



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AUTOMATIC BACK PRESSURE REGULATING and CAPACITY CONTROL VALVES

SOLENOID VALVES

STA-TITE SAFETY RELIEF VALVES

STRAINERS

HUBBELL CORPORATION
319 N. Albany Ave., Chicago 12, Ill.

Ask for Catalog

AMPLE STOCKS

1945 CATALOG

Now ready for dealers

Immediate shipment from our large stocks of valves, controls, fittings, dehydrators, Universal, Brunner and Tecumseh parts.

Write for our new 1945 Refrigeration Catalog. Address Dept. "A" at any address shown below. The Northwest served by 3 stocks located for your convenience.

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ST. PAUL 4, MINN. University at Raymond
MILWAUKEE 3, WISC. 749 No. Seventh St.
DES MOINES 9, IOWA 907 Locust St.

SURPLUS REFRIGERATION SUPPLIES

¼ H. P. to 3 H. P. UNITS

ICE CREAM CABINETS

Send for Our Surplus Stock List!

EDISON COOLING CORP.
310 E. 149th St., New York City 51

PUT RUST TO WORK!

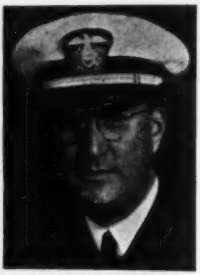
Brush or spray Nobs Glazecoat directly on rust. Rust aids in forming a permanent thermo-plastic coating that is not affected by water, alcohols, dilute acids, or alkalies. Prevents further rusting. Stands heat to 400° F. Covers about 300 sq. feet per gallon.

Price.....$3.50 per gal. F.O.B. Los Angeles

NOBS CHEMICAL COMPANY
2465 East 53rd Street, Los Angeles 11, Calif.
Seattle San Francisco

FORMER BRUNNER REPRESENTATIVE NOW A COMMANDER IN NAVY

WILLIAM M. (BILL) CASHIN, U.S.N.R., now stationed at the Naval Training School, Del Monte, California, as Commanding Officer, was elevated from Lieutenant Commander to Commander on January 3, 1945. Previous to going to Del Monte, Bill Cashin was in charge of a naval training school in the First Naval District, Boston, Mass.



WILLIAM CASHIN

During the first World War, Cashin was commissioned an Ensign and saw active service, both on destroyers and transports. In 1924 he was promoted to the rank of Lieutenant (j.g.), and in 1932 to Lieutenant (s.g.), U.S.N.R. He resigned in 1937. On June 1, 1942, he re-enrolled in the U.S.N.R. and was commissioned a Lieutenant Commander, being assigned to the First Naval District Headquarters, Boston, Mass.

Prior to his enlistment in 1942, he was, for nineteen years, the New England representative of the Brunner Manufacturing Company, manufacturers of air compressors and refrigerating equipment, and is widely known in that area. Both Brunner and his many friends in New England are looking forward to his return to the East after the war.

* * *

UNITED REFRIGERATOR TAKES OVER TWO COMPANIES

THE business of the Midwest Mfg. Co. Galesburg, Ill., and the Pittsburgh Store Fixture & Equipment Co., Blairsville, Pa., have been taken over by the United Refrigerator Manufacturing Co., Inc., of St. Paul, Minn., and Hudson, Wisc. News of United's latest acquisitions was announced recently by R. S. Wieding and J. Frank Ganley, principals in the corporation and its affiliate, United Refrigerator Chemical Division, Inc., of St. Paul, manufacturers of silica gel and other dessicants.

Both lines will be marketed after the war under the United trade-mark. All sales and advertising activities will be handled from the St. Paul headquarters of United's sales division under the direction of Mr. Wieding.

SUPPLY OF R.S.E. BINDERS EXHAUSTED

THE response to the announcement in the January issue of the sale of binders for copies of THE REFRIGERATION SERVICE ENGINEER quickly exhausted the limited supply. Due to Government restrictions, no additional binders can be manufactured this year. Announcement will appear in the advertising pages when again available. A suggestion to those service men who use the binders to maintain complete files: transfer the oldest copies from one binder, preserving them until new binders are available, and use the binder for your current copies.

ANNOUNCING—

A new compressor repairing and rebuilding service for the busy

SERVICE MAN

Prompt service—Expert workmanship
90 day guarantee—Reasonable prices

Write for quotations.

KEYSTONE ENGINEERING CORP.
844 Keystone Ave., Chicago 51, Ill.
Phone: BELmont 5635

WEST COAST CONTROL SERVICE

Cold Controls • Pressure Switches
One year guarantee on all repairs
Original Factory Specifications

UTILITY THERMOSTAT CO.
4011 Halldale Ave., Los Angeles 37, Calif.

DOLE
VACUUM PLATE
COOLING and FREEZING UNITS
CHICAGO

KEEP THEM RUNNING!
WITH
GENUINE COMPRESSOR PARTS

for

AUTO COMPRESSOR
BRUNNER
CHIEFTAIN
COPELAND
ISOMATIC
JOMOCO
MILLS
UNIVERSAL

PLUS—Complete Stock of All Refrigeration Supplies

CHASE REFRIGERATION SUPPLY COMPANY
546-48 W. 119th St. (Chase Bldg.) Chicago 28, Ill.

Controls Repaired & Rebuilt
Just Mail In Controls — We Handle The Rest
COMMERCIAL—DOMESTIC—INDUSTRIAL
One Year Guarantee
Each Control Reset and Cycle Tested

Domestic Cold Controls (Modern Type)	$2.00
Commercial Controls (Pres. or Temp.)	2.50
Commercial Dual Controls	3.00
Automatic Water Valves	2.00
Automatic Expansion Valves	1.75
Thermostatic Expansion Valves	3.00

All Prices F.O.B. Chicago and subject to change without notice.

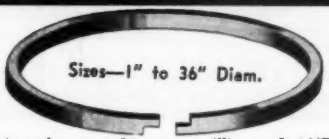
ACME CONTROL SERVICE
4613 N. Kedvale Avenue—Chicago 30, Illinois
Phone AVEnue 8532

WRITE FOR CATALOG

Due to the paper shortage we will not issue a catalog in 1945.

SERVICE PARTS COMPANY
2511 Lake St. Melrose Park, Ill.

Millions OF QUALITY
AUTO-DIESEL
LADLE TEMPERED PISTON RINGS
have been used Since 1921!



During the past 25 years millions of AUTO-DIESEL "Ladle Tempered" Piston Rings have been used as original equipment and replacement for stationary and mobile units and for hydraulic and pneumatic operated industrial equipment. The high standard of quality maintained down through the years is responsible for the large number of firms that have standardized on AUTO-DIESEL Piston Rings for so many years. We shall always maintain this high quality.

Write for Information

THE AUTO-DIESEL PISTON RING CO.
3157 Superior Ave. CLEVELAND 14, OHIO

QUALITY RINGS SINCE 1921

ZERO-SAFE
FARM FREEZER Model FF-60
Capacity: 60 cu. ft.
Other models from 15 to 80 cu. ft.

IT'S NO SECRET . . .

There's no secrecy about Wilson Post-War Plans . . . Wilson Milk-Cooling Systems, Wilson Reach-Ins and Walk-Ins for both normal and low-temperature applications, and Wilson Farm Freezers will continue to emphasize the designs, materials and workmanship which have always distinguished Wilson Cabinet Company products.

The Wilson Farm Freezer illustrated is for a farm family of six.

FOR YOUR PERSONAL USE: Let us send you our booklet on the home freezing of foods . . . It's free to you . . . Address: Dept. 14

WILSON CABINET CO., Smyrna, Delaware

Speed up
YOUR REFRIGERATION SERVICE

3 Tools in ONE...JUSTRITE

1. A gas leak detector for systems which use Freon, Carrene and other non-combustible Halide gases. 2. A light-weight "Power-Flame" soldering set for repairing connections or wiring. 3. A blow torch for "sweating" joints.

Quickly convertible. All parts built of the finest material.

Available now for priority orders. Ask your jobber.

JUSTRITE MANUFACTURING CO.
2063 No. Southport Ave., Dept. B-7, Chicago, 14, Ill.

MAY WE HELP YOU

to get the parts you need when you need them? Items in stock are shipped immediately—the impossible takes a little longer!

An inquiry or order on your letterhead will be promptly and efficiently handled.

H. W. BLYTHE COMPANY
2334 S. Michigan Ave., CHICAGO 16, ILL.

CONTROL REPAIR SERVICE

Domestic Controls reconditioned equal to new at a small cost. All work guaranteed for one year. Prices upon request.

United Speedometer Repair Co.
342 W. 70th Street
New York City 23

SERVEL VETERANS

War shortages have proved the exceptional durability of Servel Commercial Condensing Units. Thousands of Units from ten to twenty years old are cheerfully serving "a re-enlistment" for the duration—thanks to original quality and intelligent service. Insist on genuine Servel parts.

SERVEL, Inc. Electric Refrigeration and Air Conditioning Division
Evansville 20, Indiana

PROTECTING YOUR CUSTOMER IS PART OF *Automatic's Service*

When you are in a hurry to replace parts or get supplies for your customer's equipment, Automatic is ready to serve you. Our stocks are complete on all obtainable lines. Try Automatic's Service on your next order.

Automatic HEATING & COOLING SUPPLY
(DIVISION OF WEIL-McLAIN COMPANY)

2 complete stocks 2 serve you 2.

Catalogs are again available

New Phone: CENtral 2061

647 WEST LAKE STREET, CHICAGO 6, ILLINOIS

Branch at
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AUTOMATIC EXPANSION VALVES

repaired or exchanged
at $1.75 F.O.B. Chicago

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Until further notice we will be unable to accept other types of repair work.
ALL WORK GUARANTEED FOR 90 DAYS

NEW DUTY
2424 Irving Park Blvd., CHICAGO 18

Send for 1944 Catalogue

REFRIGERATION EQUIPMENT CO.
Refrigeration Parts Division
101 E. 24th Street, Kansas City 8, Mo.

WASHER PARTS DIVISION
1430 Walnut Street
Kansas City 6, Mo.

CALL ON US—for TRAINED MEN!

Whatever your manpower problems may be, let us know. We are turning out men who are wellgrounded in the principles and practice of Refrigeration service work. Many of these men are war veterans from various parts of the country. They are anxious to break into the field and will be real assets to their employers.

WRITE US TODAY

COMMERCIAL TRADES INSTITUTE

School of Refrigeration and Air Conditioning

Chicago 6, Ill.
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"Only civilian school in the country engaged to train U.S. Army men in Refrigeration"

Birmingham, Ala.
200 S. 20th St.

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Classified Ads

Rate: Two Dollars for fifty words or less, 30 cents for each additional ten words or less.

HELP WANTED—Refrigeration Shop Foreman. $75.00 weekly, 48 hours. New York City. Address Box FB-3, The Refrigeration Service Engineer, 433 N. Waller Ave., Chicago 44, Ill.

HELP WANTED—Refrigeration Service Man, Commercial and Domestic. 60% (of $2.50) time paid by customer, 10% commission, all parts and merchandise sold, mileage. Full time. Write Acme Refrigeration Engineering, 234-7th St., Merced, Calif.

FOR SALE—250 Frigidaire model "N", "W350", "W233" and "C". All with 110-220 V. 60 cycle, REP. IND. Motors. Remanufactured ice cream cabinets. Send for list and price. EDISON COOLING CORPORATION, 310 E. 149th St., New York 51, N. Y.

FOR SALE—Two gasoline driven Carrier built refrigeration units with 6 H.P. Waukesha engines. Complete with coils, 12 V. motors and blowers, valves, generators, starters, governors, controls. Less batteries. Suitable for large truck or stationary use. $550 each. Birkbeck, 522 W. Manchester Blvd., Inglewood, Calif.

FOR SALE—Universal Tools: pipe wrench, channellock pliers, adjustable wrench, Ceetee pliers, diagonal cutters, hammer, screwdriver, vise-grips, hacksaw, cold chisel, 10 piece set, $19.85. Orders shipped promptly. Remit with order. Catalogue free with order. We have it—can get it—or it isn't made. Dealers Tool Supply, 1527 Grand Ave., Kansas City, Mo.

WANTED—REFRIGERATION SERVICE MEN. We offer steady employment—High wages, plus Car Allowance and Commissions on new equipment sales to experienced domestic and commercial servicemen. Excellent opportunity for advancement. Make arrangements now to work for a large, long established Service Company holding service contracts with national manufacturers, such as Kelvinator, Stewart Warner, Hot Point and others. Write us today, giving experience, background, and other pertinent details. Murphy & Miller, Inc., 1326 S. Michigan Ave., Chicago 5, Illinois.

POSITION WANTED—Refrigeration and Appliance Executive Available. Fifteen years experience with nationally known Refrigeration and Appliance Manufacturers. Member American Society of Refrigeration Engineers. My experience has been through actual installation and service of all types of refrigeration and household appliances; Manufacturer's Branch Service manager; Divisional Service Representative; Asst. National Service Manager; Chief Inspector and Supervisor in manufacture of service repairs and assemblies. Highest type of personal references will be furnished upon request. Address Box FB-1, The Refrigeration Service Engineer, 433 N. Waller Ave., Chicago, 44, Ill.

Buying or Selling?

Use the classified columns. Used equipment can be located or sold quickly.

DAVISON'S *Silica Gel Provides*

Extra Protection

Davison's Silica Gel has become the industry's preferred drying agent because it *does more* for you than ordinary drying agents...gives you protection beyond removal of moisture.

1—it is processed especially for the dehydration of refrigerants. **2**—its scientifically-determined particle size assures you that the refrigerant will not channel—will be distributed evenly throughout the cartridge. **3**—this even distribution of the refrigerant makes it possible for it to be in complete contact with the entire pore surface area (7,500,000 square inches per cubic inch of Silica Gel) at all times. **4**—it removes acids and corrosive compounds . . . in addition to moisture . . . instantly. **5**—its capacity for moisture is not affected by oil. **6**—it will not cake nor powder. **7**—it will not attack metals or alloys.

All you have to do to get this COMPLETE DRYING AGENT that is effective on Freon, Methyl Chloride, Sulfur Dioxide, etc., is to specify Davison's Silica Gel from your jobber . . . in factory-charged dehydrators or in bulk for refill.

CURTIS BAY WORKS

THE DAVISON CHEMICAL CORPORATION

Progress through Chemistry

BALTIMORE-3, MD.

It's Easy to See Why They're Better . . .

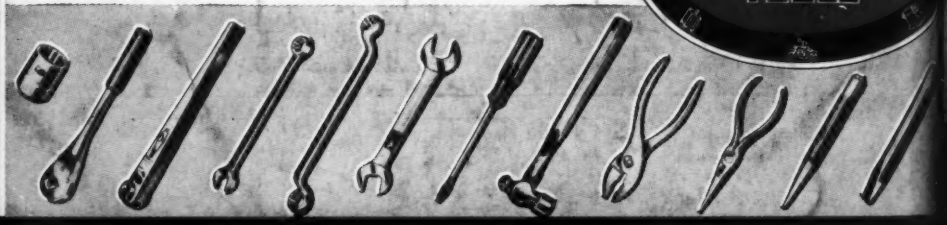
It's a funny thing about wrenches. You use them all day long. They're the most important tools in your kit. You know which ones do the job best—which ones last the longest. But chances are you never stop to think why.

When you take a good look at a Bonney Wrench, it's so easy to see why it's better.

The openings in a Bonney Engineers' Wrench, for instance, aren't just milled—they're *precision-milled.* They fit the nut exactly—no slipping, no forcing. The jaws are tapered to give you more turning room. They're reinforced with extra metal at the points of strain.

The handles are rounded for an easy, comfortable grip. And something you can't see—to make Bonney Wrenches the strongest and toughest on the market, each one is given our special pyrometer-controlled heat treatment.

We put a lot into Bonney Wrenches because we want you to get a lot out of them.

If you do not already have a Bonney Engineers' Wrench Set, ask your nearby Bonney distributor or jobber to order one for you now. All Bonney Tools are sold exclusively through distributors and jobbers from coast to coast.

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